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The Effects of Goal Setting Method on Goal Attributes and Adherence to Physical Activity and Nutrition Goals

by

Patricia Sarah Dyck

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of

Master of Arts

Faculty of Physical Education and Recreation

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Abstract

Despite previous research indicating that goal setting improves adherence to behaviour change, little is known about the specific aspects of goal setting which need addressing. The present study examined the effects of different goal setting methods for physical activity and nutrition on goal attributes and goal adherence. Self-efficacy for physical activity and nutrition behaviours was also studied. Participants (N = 54) wanted to lose weight through changes in physical activity levels and eating habits. No significant differences were found between the three conditions on goal acceptance, commitment, influence, or achieveability. Similarly, no significant differences were found between conditions for goal adherence. Relating to self-efficacy, results found a main effect for time, but no main effect for condition and no interaction for time by condition. Results of this study suggest that method of goal setting may not be as important as providing a supportive environment.

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Introduction

Canada is generally believed to be a world leader in health promotion policy and practice. In 1974, a report entitled *A New Perspective on the Health of Canadians*, now known as the *Lalonde Report*, was released. This report was the first statement by a national government suggesting that health resulted from the interplay of biology, environment, lifestyle, and the system of health care. It was the introduction of lifestyle and the environment into the equation that contributed to a re-examination of the role of health care delivery in fostering health (Pederson, O'Neill, & Rootman, 1994).

Support for health promotion has come from agencies and individuals committed to nurturing health in addition to focussing on the reduction or prevention of disease. However, perhaps the strongest influence on the enthusiasm for health promotion is the concern over spiralling health care expenditures; costs resulting from various systems of publicly funded health care (Pederson et al., 1994). "At roughly $72 billion annually, or $2,500 per capita, Canada has one of the most expensive health care systems in the industrialized world" (National Forum on Health, 1996, p. 12).

The "new public health" is the expression of a renewed understanding that interventions outside of the traditional domain of the health field (in education, for example) are key to improving population levels of health (Pederson et al., 1994). Two of the most common elements of health interventions are physical activity levels and dietary habits. Research has continuously shown that increases in physical activity and improvements in eating habits have immense health benefits. For example, physiological benefits of physical activity include decreased incidence of cardiovascular disease

(Georgiou, Betts, Hoos, & Glenn, 1996), Type 2 diabetes, osteoporosis, and several types of cancer (Young & King, 1995). As well, physical activity plays a key role in altering body weight, body composition, basal metabolism and appetite (Dishman, 1994). Psychological benefits of participating in regular physical activity include increases in self-concept and self-esteem and decreases in depression and anxiety (Dishman, 1994; Weyerer, 1992; Weyerer & Kupfer, 1994). Examples of the benefits of improved nutritional habits include increased energy levels and improved body functioning and maintenance (Sizer & Whitney, 1994). Furthermore, incorporating both increased physical activity and improved eating habits into ones routine may also result in weight maintenance and/or weight loss (Hagan, 1988).

While the benefits of physical activity and positive eating habits are being widely promoted through educational programs, it appears that a large majority of Canadians experience difficulties when trying to incorporate these into their lifestyles. Research shows that compliance with recommended increases in physical activity and improved diet is usually low (Marcus & Stanton, 1993). To illustrate, studies reveal that between 35% and 85% of exercise program participants drop out during the first 3 to 6 months of the program (Dishman, 1988). For researchers and other health professionals, this raises serious concerns regarding how to increase adherence to positive health behaviours.

Goal Setting

One technique used in other settings to encourage performance and to increase adherence to behaviour change is goal setting. Research into goal setting was first conducted in organizational and industrial settings and its success in these domains has

been well documented (Locke & Latham, 1990). It has only been in the last decade that goal setting has been used extensively in the sport and exercise domain (Weinberg, 1994). In these areas, results are promising; a meta-analysis conducted by Kyllo and Landers (1995) confirmed that goal setting is a successful technique for motivating sport and exercise performance. Relating to adherence, several researchers report that interventions that have included exercise goals are effective in increasing exercise adherence (Dishman, 1988; Young & King, 1995). In support, Poag and McAuley (1992) suggest:

> We can assume that setting appropriate, realistic exercise goals might be a useful strategy in motivating individuals to exercise and in encouraging them to maintain this behaviour long enough to achieve the associated health benefits (p. 353).

The usefulness of goal setting in changing nutritional behaviours is unclear. Very little formal research has been conducted on setting goals for nutrition. However, anecdotal reports from dietitians appear promising. For example, a dietitian may recommend that a client decrease the amount of fat in his/her diet. It could be argued that this recommendation, if accepted and translated into a behavioural objective, could be considered a goal for which the client can strive. According to Diane Briton (1998), a practising registered dietitian, the short-term success rates (within the first 3 weeks) for clients meeting recommendations is high. If these recommendations are considered goals, then it can be hypothesized that goal setting would be a useful technique in the nutrition domain, at least in the short-term.

Although goal setting is a relatively new adherence technique in the exercise and nutrition domains, its potential for success is great. Based on previous research, Locke and Latham (1985) have concluded that goal setting improves performance in several ways. First, goal setting *focuses and directs one's activities* (providing the goals set are *specific*). Second, it *regulates one's expenditure of effort*. Third, it *enhances persistence and effort* toward meeting the goal or sub-goal. Fourth, goal setting can promote the *development of new strategies* for improving performance. Fifth, in addition to the above ***direct*** effects on performance, goal setting gives an individual *a sense of control and positive self-direction* (Locke & Latham, 1985). Similarly, Edmunds (1991) noted that setting appropriate, attainable goals for physical activity and diet is important in providing milestones against which progress may be measured. With the above listed benefits in mind, exercise and nutrition counsellors may be able to use goal setting as an effective technique to increase adherence to physical activity and positive eating habits. The dilemma relating to this, however, lies in identifying what aspects of goal setting should be addressed in order to most effectively design interventions.

Moderators of Goal Effectiveness.

While goal setting may be successful in motivating people to pursue positive physical activity and nutrition behaviours, Kyllo and Landers (1995) state that there is a general lack of research addressing specific aspects of goal setting and mechanisms of effectiveness. "To understand and explain the effect of goals on action, it is necessary to understand the mechanisms by which goals produce their results" (Locke & Latham, 1990, p. 86).

One suspected moderator of the effectiveness of goals is the method of goal setting (Locke & Latham, 1990). There are at least three different methods; assigned (where the researcher sets the goals for the participant), participative (where the researcher and the participant set the goals together), and self-set (where the participant sets his/her own goals). Furthermore, it is suspected that goal attributes are moderators of the method of goal setting/goal effectiveness relationship (Fairall & Rodgers, 1997). Goal attributes, such as acceptance, commitment, influence, and achieveability have been identified as indicators of goal effectiveness. Additionally, several researchers have considered goal attributes to be important to the goal setting/performance relationship (e.g. Brawley, Carron, & Widmeyer, 1992; Burton, 1984; Dossett, Latham, & Mitchell, 1979; Erez & Kanfer, 1983; Kyllo & Landers, 1995; Latham & Saari, 1979; Latham& Yukl, 1976; Locke & Latham, 1990; Weinberg, 1994).

With the above in mind, only a few studies have addressed the effects of method of goal setting on various goal attributes. Some studies would indicate that the method of goal setting does not differ in its effect on goal attributes, provided the goals are reasonable and the environment is supportive. For example, Locke and Latham (1990) suggest that participation in goal setting does not have a more positive effect on goal attributes than assigning goals. Fairall and Rodgers (1997) confirmed this claim with the results from a field experiment involving varsity track and field athletes. In this study, the authors found no significant differences in perceptions of goal attributes between athletes who were involved in participative, assigned, or self-set goal setting. This finding may, in part, be attributed to the supportive environment that was maintained with

the athletes throughout the goal setting interventions.

Study Rationale

The results of goal setting studies are only generalizable to the context/settings in which they were researched. Therefore, while it has been shown that goal setting is an effective performance intervention in industrial, organizational, sport, and (in some cases) exercise settings, it is unclear whether or not this finding would be replicated in an exercise and nutrition setting. More specifically, it is unknown whether setting goals for physical activity and nutrition is an effective technique to motivate overweight women to incorporate positive health changes into their lives.

Part of the reason goal setting is specific to the context in which it is researched may be because the motivations to actually achieve goals in various settings could be very different. It is important to consider that there are both positive (i.e. move toward) and negative (i.e. move away) motives. For instance, a person may engage in a behaviour to gain rewards or to avoid pain or punishment. 'Motive' is used here to describe the "impetus" for the behaviour being examined. Therefore, it is likely that women who struggle with weight loss would have different motives for meeting their goals than athletes or paid employees. It may be that overweight women rely more on internal motives to meet their goals. This is because the *external* consequences for not meeting their weight loss goals could potentially be less severe, at least in the short term, compared to athletes or paid workers. To expand, coaches often use goal setting as a technique to help their athletes maintain and/or improve performance. Achieving certain goals is important for athletes in order for them to keep their standings and/or remain on a

team. As well, athletes are often so devoted to their sport that achieving a certain level of performance becomes their highest life priority. Similarly, paid workers often work towards meeting goals that relate to certain productivity standards. If they do not meet these standards, they risk being fired or demoted. Where livelihood is at stake, most people will do whatever it takes to meet their goals and reduce the risk of losing their pay cheque.

For women wanting to lose weight, the situation is very different; there is no *external* fear of being dismissed from the team or being fired from work if they do not meet their physical activity or nutrition goals. On the contrary, if they ***do*** meet their goals, they may risk being neglectful of the needs of other family members or their jobs. As primary care givers, many women put aside their own needs in order to focus their time and energy on making sure that the needs of their families' are met.

> As women and mothers we share a clear and deep sense of obligation... We do this because we believe that it is part of our responsibility to do the physical and emotional work needed to maintain the members of our family and to nurture the relationships between them (Bella, 1992, p. 29).

In other words, unlike many athletes, increasing physical activity and improving dietary habits is not a high priority for some women who struggle with weight loss.

There appears to be a double-edged sword at work where overweight women are concerned: if they spend the time meeting their own needs, they risk not meeting those of their family. However, if they do not spend the time on themselves they also face other consequences for not succeeding in weight loss. Many North American women who are

overweight face daily discrimination from friends, relatives, coworkers, and potential employers. This is because our society believes "the most preposterous fairy-tale ever concocted: that to be fat is to be like Cinderella's stepsisters - ugly, lazy, mean, and stupid - and to be thin is to live happily ever after" (Poulton, 1996, p. 40). Along with discrimination, women who fail at weight loss would likely experience negative psychological outcomes such as disappointment, frustration and possibly low self-efficacy and self-confidence. These outcomes, in turn, could potentially influence future efforts at weight loss.

Additionally, while the above psychological outcomes would be felt fairly quickly, the negative physiological effects of extra weight, lack of physical activity, and/or poor nutrition may not be felt in the short term. This sets up a paradoxical situation where there are no apparent positive outcomes to short term (extending to quite a long term) adherence or nonadherence to physical activity and nutritional behaviour change. The positive effects of the former and the negative effects of the latter are unlikely to be realized for months or years (taking into consideration a myriad of other factors such as other health conditions and age). Furthermore, the short term effects of behaviour change are likely to be negative: muscle soreness and fatigue with exercise and reluctant goodbyes (and possibly a sense of deprivation) to favourite foods and eating behaviours in the case of nutritional change. Such a state of affairs, which is very emotionally-charged, highlights the need to establish plausible short term goals for physical activity and nutritional change.

To the researchers knowledge, no other studies have been conducted that

specifically consider methods of goal setting and their effects on goal attributes and adherence to exercise and nutrition behaviours in this population. Findings of this study could be particularly valuable when planning physical activity, nutrition, and/or weight loss programs for overweight females. Presently, due to limited time and resources, many programs are run on a group basis, with little individual counselling (e.g. Weight Watchers). In these programs, counsellors often attempt to incorporate goal setting as a technique to increase adherence to certain behaviours. For example, people who join the Weight Watchers program are assigned a range of "food points" to be used as a guideline when choosing the amount and types of food they eat on a daily basis. The amount of food points assigned, or "goal" number of calories to be consumed daily, is determined by the participants' age and "goal" weight (which Weight Watchers counsellors determine based on height and weight tables).

There are several potential problems relating to the way that goal setting is being used in some physical activity, nutrition, and/or weight loss programs. For example, counsellors in these programs often disguise behaviour modification techniques as goals (e.g. counting chews and putting the fork down between bites). While these are certainly means of accomplishing behaviour change, these techniques are likely too short term to be effective motivators and will probably become tedious over time rather than fostering a sense of accomplishment. Additionally, when goal setting is incorporated into these programs, its importance is discussed at length, however, little time is spent setting goals specific to each individual. Instead, either `blanket' goals are assigned to all participants (hopefully based on the latest research findings) or the participants are left to set their

own goals relating to physical activity and/or nutrition. It is unknown whether or not these assigned or self-set goals are effective in accomplishing behavioural changes in this population.

One reason why assigned goals are questioned is because they often do not specifically, and personally, relate to each participants' life situation. In order to motivate behaviour change, it has been hypothesized that goals must be specific and personal. Additionally, self-set goals are questioned because this population has a history of setting unachievable, unrealistic, and unhealthy goals. Women who struggle with weight loss are often looking for quick fixes; magic pills that will take off the pounds in a relatively minimal amount of time, with a minimal amount of effort. For women who set unrealistic goals, failure is inevitable. Therefore, to increase the chances of success, programs using goal setting as a technique for behaviour change must incorporate a method of ensuring that the goals set have certain characteristics, or attributes that have been associated with successful behaviour change in other domains.

Goal Attributes.

As previously stated, goal effectiveness is believed to be mediated by goal attributes. In an exercise and nutrition setting, the goal attributes of acceptance, commitment, influence and achieveability are especially pertinent. Goal acceptance is the extent to which a person favourably receives or accepts a goal. Goal acceptance is necessary for goal commitment. "It goes without saying that goals which are not accepted or to which there is no continuing commitment will not affect performance (behaviour)" (Locke & Latham, 1985, p. 208). Goal commitment is defined as the extent

to which a person is dedicated to a goal.

> It is virtually axiomatic that a goal a person is not *really* trying for, is not *really* a goal, and therefore cannot have much effect on subsequent action. Only an individual who is genuinely trying for a goal can be described as being committed to that goal (Locke & Latham, 1990, p. 124).

Acceptance and commitment may depend on such things as incentives (rewards), intrinsic motivation from the task itself, supervision, and supervisory expertise (In Latham & Yukl, 1976). Acceptance and commitment have been associated with goal influence (Locke & Latham, 1990). Goal influence relates to the extent to which goals affect behaviour. In turn, goal influence is related to goal achievement in that a goal has to have some effect on behaviour before the goal can be reached. Goal achieveability is defined as the degree to which a goal can be reached. This is important in an exercise and nutrition setting because goals that are not viewed as achievable, or realistic, will have little effect on motivation. As mentioned previously, one problem among individuals adopting new exercise and nutritional goals is that they often unintentionally self-set unrealistic goals. As can be seen, however, these goals are likely to be demotivating in the long run. One key concern of the present study, therefore, is to determine means of setting realistic goals that are acceptable to a population with a history of unrealistic attempts at behaviour change, failure in these attempts, and little behavioural or content specific (i.e. exercise and nutrition) knowledge on which to base their goals (Gaesser, 1996). A challenge will be to provide sufficient and relevant information to the participants to facilitate effective goal setting.

Goal Setting Theory

Locke and Latham's (1990) theory of goal setting proposes that most human behaviour is considered to be consciously regulated and goal directed. The theory is based on the assumption that goals serve as immediate, though not sole, regulators of action and they represent an end state towards which a person strives. Locke and Latham note, however, that a goal does not have to be in constant conscious awareness in order for it to regulate action.

> Usually, a goal, once accepted and understood, will remain in the background or periphery of consciousness, as a reference point for guiding and giving meaning to subsequent mental and physical actions leading to the goal (Locke & Latham, 1990, p. 5).

It should be noted, however, that not all actions undertaken by a person, whether consciously or unconsciously initiated, will correspond to the intended action or will achieve the desired goal. This can be due to many reasons including lack of sufficient knowledge or ability, changed circumstances, or illness. This consideration is particularly relevant to women wanting to lose weight. For example, relating to insufficient knowledge, a woman may set a goal to lose 10 pounds and maintain this loss, however, she may not know the most effective method or time frame in which to do this. Therefore, she may decide that a particular 'fad diet' will help her to achieve her goal. Given the 95 - 98 percent failure rate of dieting, this diet may initially help her to lose the weight, however, it may not help her to maintain the weight loss (Poulton, 1996).

The core findings supporting the goal setting theory are based on data from close

to 40,000 subjects in 8 countries; 88 different tasks; laboratory and field settings; experimental and correlational designs; numerous types of performance measures, time spans ranging from 1 minute to 3 years; studies of assigned, self-set, and participatively set goals; and data from the individual, the group and the organizational levels of analyses. The overall usefulness and validity of the theory is attested to by enumerative reviews, meta-analyses, peer evaluations, and comparative assessments of goal setting against other theories (Locke & Latham, 1990).

In the following pages, operational definitions will be given along with a presentation of the key findings from several of the above mentioned studies. As well, short-term, long-term, behavioural and outcome goals will be discussed. In addition, methods of goal setting will be addressed as moderators of the goal effectiveness - goal performance (behaviour) relationship. In turn, the goal attributes of acceptance, commitment, influence, and achieveability will be described as moderators of the method of goal setting - goal effectiveness relationship. Finally, self-efficacy will be presented as it relates to goal setting.

Goals

Goals can be defined in a number of ways; (1) "What an individual is consciously trying to do" (Weinberg, 1994, p. 469); (2) "What [an] individual attempts to accomplish" (Gallucci, 1995, p. 110); and (3) The aim or object of an action (Locke, Shaw, Saari, & Latham, 1981).

Basically, a goal provides an individual with the incentive, or motivation, to initiate an action (Locke & Latham, 1985). Along with this incentive, goals are used by

the individual to define what an acceptable direction of action or level of performance is. Actions that meet or exceed desired ends lead to positive appraisals. In contrast, actions that do not meet desired ends are appraised as unsatisfactory and lead to negative self-evaluations and/or performance evaluations.

Goals should be situationally and task specific. Situational factors include such influences as the demands or requests of authority figures, role models, peer pressure, cultural standards, incentives, rewards, and punishments (Locke & Latham, 1990). Relating to overweight women, situational factors may include a doctor's recommendation to lose weight for health reasons, a spouse's suggestion to lose weight for aesthetic reasons and/or the media's subconscious pressure to lose weight in order to be `beautiful and sexy.'

In terms of goal characteristics, goal setting research has repeatedly shown that people who try to attain difficult goals perform better on a task than people who try for moderate/easy goals or vague goals such as `do your best' (Locke & Latham, 1990). However, difficult goals must have certain characteristics in order to be effective in improving performance; difficult goals must be personal, positive, challenging, specific, controllable, measurable, and attainable. Additionally, these characteristics need to be present simultaneously in order for the difficult goal to be effective (Locke & Latham, 1990).

When researching goal setting for physical activity, nutrition, and weight loss, it is important to consider the types of goals that people may set. In the present study, there are four types of goals that will be addressed; behaviour and outcome goals, and short-

term and long-term goals.

Behaviour and Outcome Goals.

Goals are often defined in terms of behaviour (performance) and outcomes. Behaviour goals are goals that relate to a persons' actions. Specific examples of behaviour goals relating to physical activity and nutrition would be "to walk 3 times per week for 30 minutes each time"; "to bench press 50 pounds for 2 sets of 10 reps twice per week"; "to eat five servings of vegetables daily"; and "to decrease the amount of fast food consumed to 1 meal per week."

Outcome goals are goals that relate to overall end results and are achieved as a function of achieving the behavioural goals. Examples of outcome goals relating to physical activity and nutrition include "to decrease blood pressure"; "to feel better about myself"; "to increase energy"; and "to reduce stress."

Overweight women may have a tendency to focus more on outcome goals; "to lose 10 pounds" or "to comfortably fit into that red dress" are two examples. They recognize that setting behavioural goals (i.e. "to be more physically active" or "to eat less fat") may help them in their quest. However, as witnessed with the two previous examples, the behavioural goals that are set lack the specificity and direction needed to guide behaviour on a day by day or moment by moment basis.

Burton (1984) has suggested that there are at least two problems associated with outcome goals. First, they allow people to only partially control their own success because there are a number of factors beyond a person's control. For example, someone wishing to lose 10 pounds may have trouble doing so because of her genetic

predisposition. Second, outcome goals lack flexibility (primarily because they also lack the specificity of behavioural goals). In this way, they do not allow a person to raise or lower her goals in order to keep them challenging and realistic for her current capabilities and situation. Burton (1984) provides an example of the problem with an inflexible outcome goal within a sport context:

> Young swimmers who have not yet learned to overemphasize winning naturally raise their goals slightly following success to keep them challenging *but* also lower them when unsuccessful to prevent repeated failure. Unfortunately, eventually competition teaches swimmers that success means winning and failure means losing and, once indoctrinated, swimmers become unwilling to lower their goals to keep success realistic if they believe those goals will jeopardize winning (p. 26).

Short-term and Long-term Goals.

When setting goals, it is important to consider both short-term and long-term goals. Results of a meta-analysis by Kyllo and Landers (1995) supported combining short-term (proximal) and long-term (distal) goals in order to increase performance enhancement instead of solely using long-term goals. This is because long-term goals are often too vague and future-oriented to have motivational significance in the present. Locke and Latham (1985), also point out that setting short-term goals prevents viewing the end-goal as beyond one's capability. In this way, goals seem more *achievable*. This is especially important to keep in mind when designing weight loss interventions involving physical activity and nutrition goals. Just as it is common for overweight

women to focus mainly on outcome goals, it is also very common for them to solely set long-term goals without setting any short-term goals. The long-term goals that are set often relate to large amounts of weight that the woman desires to lose. The motivation to reach these long-term goals often diminishes long before the goal is achieved (i.e. when they hit a weight loss plateau even though they were following their "diet" and exercise routine religiously). It is suggested, therefore, that instructors of physical activity, nutrition, and weight loss programs should certainly encourage the setting of long-term goals, however, they should also promote the setting of short-term goals with a behavioural focus that could possibly be used as "stepping stones" to reach the long-term goals.

A number of studies have compared the effects of short-term goals with those of long-term goals. It should be noted that goal setting theory does not make any predictions about the relative effectiveness of each type of goal (Locke & Latham, 1990). However, favouring short-term goals is the argument that they may be more psychologically `real' to individuals than long-term goals. Therefore, they may prevent procrastination and premature discouragement. Favouring long-term goals is the argument that they are more flexible and can more readily be adjusted to short-term circumstances and contingencies.

Given the above, it is understandable that the research findings on this matter are not consistent. One study conducted by Bandura and Simon (1977) found that short-term (daily) goals were more effective than long-term (weekly) goals in facilitating weight loss. These researchers also found that some participants given weekly goals actually

self-set daily goals. In this study, participants who used short-term goals lost more weight than those who used long-term goals and those who had no goals. In another weight loss study, it was initially found that short-term (daily) calorie goals were not superior to long-term (weekly) goals. However, in a three-month follow-up, only those using short-term goals continued to lose weight (Dubbert & Wilson, 1984).

In contrast to the above findings, several studies have found no difference in the effects of short-term and long-term goals. For example, one study found no difference in the effects of one-week and five-week goals for exercise on physical fitness (Martin et al., 1984).

Adding to the uncertainty of the effectiveness of short-term versus long-term goals is the fact that there is little knowledge about the 'ideal' time span for a goal. It is likely that goals that are too frequent will be viewed as distracting, intrusive, and annoying and thus will be rejected. In contrast, goals that are too distal may be seen as unworthy of serious or immediate attention.

It has been suggested that the ideal time span could differ with different situations and tasks and with different types of people (Locke & Latham, 1990). This can be illustrated by further examination of physical activity and nutrition behaviours. Whereas physical activity is typically engaged in anywhere between zero to six times per week, eating is typically engaged in three to six times per day, with even more opportunities to make spontaneous decisions (e.g. when walking by a candy machine).

It is necessary, therefore, to consider a behaviour/time ratio when determining the optimal "term" for short and long-term goals. It is tentatively put forward here that one

day may be an optimal short-term length for nutrition goals, with one week being a "midrange" goal. For physical activity, it is put forth that one week may be an optimal short-term length for physical activity goals , with six weeks serving as a "midrange" time frame. It is also suggested that no set time frame be given to "long-term." Instead, it should be defined by the type of goal set (physical activity or nutrition) and the appropriate time frame needed for the individual to achieve the goal. For example, one sedentary person may start an exercise program with the short-term goal "to walk twice per week for 20 minutes." The same person may accomplish a long-term goal "to walk 3 times per week for 40 minutes" in 8 weeks. Another sedentary person might start out with the same short-term goal, however, he/she may take 12 weeks to reach a similar long-term goal.

Methods of Goal Setting

As stated previously, there are at least three methods of goal setting - assigned, participative, and self-set. Assigned goal setting is where the researcher/counsellor establishes the goals and presents them to the participant. Participative goal setting involves the researcher/counsellor and the participant jointly establishing goals. Conversely, self-set goal setting involves the participant establishing his/her own goals without input from the researcher/counsellor. It should be noted that goal setting theory makes no a priori assumptions relating to the relative effectiveness of different ways of setting goals (Locke & Latham, 1990), suggesting that the effectiveness of the method will be related to the context.

Assigned Goal Setting.

In industrial settings, the majority of goal setting studies involved goals that were assigned to subjects by external sources such as supervisors or researchers (Gallucci, 1995). Many of the studies involved comparing assigned goal setting to participative or self-set goal setting. In industrial settings, assigned goal setting has been shown to be very effective; in many cases, assigned goals have worked just as well as goals set jointly by the supervisor and the subordinate (Locke & Latham, 1990). A study relating to productivity in typing speed illustrates this. The study, by Latham and Yukl (1976), used both assigned and participative goal setting to see if one technique would lead to higher improvements in typing speed than the other. During the first five weeks of the goal period, there was no significant improvement in productivity in either goal setting condition. However, during weeks 6 to 10, productivity improved significantly in both conditions.

To further illustrate the effectiveness of assigned goal setting, Ludwig and Geller (1997), conducted a study to improve driving safety habits of people delivering pizza. Results of their study supported the conclusions of Locke and Latham (1990); both goal setting techniques increased safe intersection stopping. Additionally, the study showed that goals set participatively did not improve target performance any more than goals that were assigned.

One possible explanation regarding the above findings relates to the "simplistic" relationship between behaviour and outcome in industrial settings. In these environments, if an individual does their job, they get paid, and they keep their job.

However, in weight loss settings, the behaviour (i.e. increased physical activity) may not directly translate into the outcome (i.e . weight loss). This may be due to a number of reasons including genetics and lack of knowledge.

The Relationship Between Assigned Goals and Personal Goals.

Goal theory asserts that assigned goals affect performance through their effects on personal goals (Locke & Latham, 1990). That is, the effect of assigned goals is mediated by personal goals (Lerner & Locke, 1995). For this reason, it is recommended that personal goals be measured in studies that include an assigned goal setting condition. The measurement of personal goals does two useful things:

> (a) It serves as a manipulation check on the success of the assigned goal conditions, and (b) it allows more precision in prediction, because personal goals will typically be more closely related to performance than assigned goals (Locke, 1994, p. 213).

Locke (1991) has stated:

> To a great extent, people in laboratory settings work toward the goals assigned to them but this is by no means always the case. Thus, to know how a person will perform, it is imperative to know what personal goals each person sets in response to the goal that is assigned (p. 313).

Subjects who tend to set personal goals despite being assigned specific goals can certainly complicate the designing of goal setting studies. However, it is important to recognize the message that is being sent by participants; having someone else set goals may be ineffective because participants will set their own goals anyway (Weinberg &

Weigand, 1993). This is consistent with data collected by Weinberg, Burton, Yukelson, & Weigand (In Weinberg & Weigand, 1993) where collegiate athletes reported that they definitely preferred setting their own goals rather than having them set by their coach.

Participative Goal Setting.

Research has shown that specific, difficult goals have lead to higher performance when participants are committed to the goals (Locke & Latham, 1990). To gain commitment, however, Locke and Latham (1985) suggest that participation in goal setting may sometimes help. In support, Kyllo and Landers (1995) report "Goal setting seems to be more effective at improving performance...when individuals are allowed to set, or at least participate in setting, the goals" (p. 130). The results of a study by Latham and Yukl (1976) confirm these statements. The authors found that logging crews involved in participative goal setting had higher productivity than crews that were assigned goals and crews that were told to 'do your best.' While other studies may find no difference in productivity between participative and assigned goal setting conditions, Latham, Mitchell, and Dossett, (1978) state:

> in no instance to the authors' knowledge have supervisory assigned goals been shown in the scientific literature to be superior to participatively set goals. At most, the two methods of goal setting have been shown to be equally effective (Latham et al., 1978, p. 167).

Participation in decision making has many benefits. First, it increases knowledge and understanding by providing information on a person-to-person level and by giving participants an opportunity to appraise the information. Second, participation gives the

individual more control of the situation, reduces anxiety, and creates commitment to the decision (Erez & Kanfer, 1983). Third, participation in goal setting may be important because it leads to higher (more difficult) goals being set and it promotes a greater understanding of the effort and behaviour required (Latham & Saari, 1979).

Self-Set Goal Setting

As previously noted, it is common for participants in sport and exercise settings to set their own goals without consultation or negotiation with other athletes/participants or the coach/exercise consultant. Goals negotiated between the athlete/participant and the coach/exercise consultant may have different characteristics (e.g. clarity, importance) than the personal goals perceived and set by the participant (Poag-DuCharme & Brawley, 1994).

Relating to performance, Locke (1994) notes that previous goal setting research studying the effects of self-set goals has found the same results as for assigned goals. However, results from a series of studies that evaluated the effects of encouraging healthy, sedentary adults to set daily distance goals for walking or jogging based on how they felt that day contradicts this statement (Martin et al., 1984). These studies reported more positive results from those participants who set their own goals. Results showed that groups of subjects with flexible self-set goals recorded increased attendance at walking and jogging classes in comparison to groups of subjects that were assigned distance goals for walking and jogging by the experimenters. As well, the lowest dropout rates were in the groups who set their own flexible goals.

To try to understand these contrasting findings, it is again important to consider

the motivational climate of the various settings. In industrial work settings, for example, people are likely to be extrinsically motivated to self-set goals to improve performance. This is because improving performance by any means will likely result in positive outcomes (i.e., a raise or a promotion). In terms of an exercise/nutrition context, many overweight people are also likely to self-set goals. It is common for this population, however, to set unrealistic goals in attempts to find 'quick fixes' to weight loss. "People seem to be conditioned to think that they need to undertake and adhere to massive changes. When they do not succeed, they usually feel guilty" (Laquarta, 1997, p. 112). This is partially because the population, in general, lacks knowledge specifically relating to the most effective methods of weight loss. Unfortunately, the unrealistic goals self-set by this population will likely result in few positive outcomes. This further supports the idea of providing sufficient and relevant information to the participants to facilitate effective goal setting.

Goal Attributes

Acceptance.

Goal acceptance is defined as the extent to which a person favourably receives or agrees to a goal. Accepting goals is critical in goal-setting research (Kyllo & Landers, 1995). There is no reason to expect that goals that are not accepted will have any effect on behaviour.

One technique that has been suggested to increase goal acceptance is participation in decision making. Locke (1968) predicted that performance improvement is greater when goals are participatively set rather than assigned in those cases where participation

leads to the greater acceptance of the goals. This is because it cannot be assumed that assigned goals will match the assignees personal (self-set) goals. In this way, assigned goals may not be accepted, especially in field settings. This supports the notion that goal acceptance should be measured when testing the effects of different methods of goal setting. "The process of evaluating goals with regard to their individual acceptability becomes most important when variance in acceptance is recognized" (Erez & Kanfer, 1983, p. 454).

With this in mind, however, and considering the inconsistency in results of previously described studies, it should not be surprising that the results of studies testing different methods of goal setting on goal acceptance have also been inconsistent. One study conducted in 1943 by Lewin demonstrated the superiority of participative over nonparticipative techniques in changing consumers' behaviour and eating habits (In Erez & Kanfer, 1983). However, several more recent studies conducted in varying domains have found results that contradict those described above. For example, a study using engineers and scientists to test method of goal setting on goal difficulty and job performance showed that goals that were participatively set were no more accepted than goals that were assigned (Latham et al., 1978). As well, similar results were found in a study that involved brainstorming by college students (Latham & Saari, 1979) and a study that involved solving arithmetic problems (Dossett, Latham, & Mitchell, 1979). In addition, a study of varsity track and field athletes found no significant differences between assigned, participative, and self-set goal setting groups on goal acceptance for practice, seasonal and long-term goals. One possible explanation for results of the latter

study, however, may relate to the fact that the coach had an indepth knowledge of the athletes capabilities prior to setting their goals.

> If the coaches established what the athletes felt were realistic and achieveable goals, athletes would accept the assigned goals, irrespective of the degree of participation they had in setting the goals (Fairall, 1993, p. 65).

Commitment.

Goal commitment is defined as the extent to which a person is dedicated to a goal. This involves the determination to try for a goal and the persistence in pursuing it over time. Commitment is a critical factor in working hard to achieve a difficult goal. In many cases, commitment implies that the goal has been accepted (Locke, 1991).

The literature suggests that individuals will be more committed to self-set or participatively set goals than to assigned goals (Locke & Latham, 1990). Again, this finding is not consistent across settings. For example, one study looking at the effects of goal setting on academic performance found no differences in goal commitment between self-set and assigned conditions (Hollenbeck, Williams, & Klein, 1989). Further supporting this, results of Fairall and Rodgers' (1997) study revealed that athletes were highly committed to the goals that were established, regardless of the method of goal setting. Again, relating to the motivational context of this study, it was expected that athletes who dedicate ten to fifteen hours per week of training for a voluntary activity would be committed to their goals.

Influence.

Goal influence relates to the extent to which goals affect behaviour. The

importance of measuring goal influence is witnessed in an exercise study by Gallucci (1995). He found that participants who rated goals as more influential had higher attendance rates in aerobics classes two months after making these ratings. However, in order for goals to influence behaviour, Locke and Latham (1990) suggest that goals must be clear to the individual and the individual must be committed to their fulfilment. They also suggest that the relationship between commitment and exercise behaviour is *mediated* by the way individuals perceive that their goals influence their behaviour. Poag-DuCharme and Brawley (1994) tested this hypothesis and results of their study indicated that goal influence mediated the goal commitment - exercise intensity relationship at program onset but not midprogram. This finding may have been due, in part, to the goal attribute of clarity (which is the need for goals to be measurable and to be defined in terms of specific behaviours). The researchers found that both goal clarity and goal commitment increased significantly between program onset and midprogram.

Achieveability.

Goal achieveability is defined as how reachable a goal is. Whether or not a goal is perceived as achievable relates to a persons' ability level. In order to be achievable, goals should be specific. What is unclear in the literature, however, is how difficult these specific goals should be. As previously stated, difficult goals lead to higher levels of performance than do easy or vague goals (Locke et al., 1981). However, research into goal setting has found that the relation of goal difficulty to performance is curvilinear in that performance levels off after the limit of ability has been reached (Locke & Latham, 1990). This means, therefore, that in order to gain or maintain peak performance, goals

should be as difficult as possible while still being achievable.

In addition to being specific and difficult, achievable goals must also be realistic. A study conducted with skilled swimmers illustrates this point. In this study, Burton (1984) compared realistic goal setters with unrealistic goal setters and found that realistic goal setters had increased confidence, expended more effort, felt more successful and satisfied, improved their performance more, and set more accurate future goals.

Self-efficacy

Bandura (1986) defines self-efficacy as "a person's judgement of their capability to organize and execute their skills and resources to perform an action that will lead to a designated outcome" (p. 391). Self-efficacy includes a judgement of one's total capability of performing a task. In short, self-efficacy is situation specific self-confidence and is an important predictor of behaviour in a variety of domains (Maddux, 1995).

Self-efficacy has been found to play multiple roles in goal setting theory. Of specific importance is self-efficacy's influence on the goal attributes of acceptance, commitment, and achieveability. It seems reasonable that participants must feel efficacious over the behavioural requirements of their goal in order to accept that goal.

> Bandura argues that judgements of self-efficacy influence choices of behaviour people undertake, such as acquisition of new behaviours (e.g. starting an exercise program) and the inhibition of existing behaviours (e.g. decreasing high-fat food choices) (AbuSabha & Achterberg, 1997, p.1123).

As well, it is predicted that the chances of committing oneself to a hard goal would be

higher when self-efficacy for a behaviour is high as opposed to low. This is because self-efficacy affects the amount of effort people will expend while adopting a new behaviour and their persistence in the face of obstacles. For example, high dietary efficacy predicts decreased attrition from weight-loss programs and increased ability to lose weight (AbuSabha & Achterberg, 1997, p. 1123).

Of equal importance to acceptance and commitment, participants must feel that their goal is achievable in order to feel efficacious about it. In general, people tend to pursue tasks they think they can accomplish and avoid those they believe exceed their capabilities. For example, if a person has high confidence in his or her ability to resist fast food, then the likelihood of that person not consuming hamburgers and french fries is increased (AbuSabha & Achterberg, 1997). Self-efficacy, therefore, has implications for these goal attributes, as well as, subsequent performance.

Study Purpose

The purpose of the present study, therefore, was three-fold. First, a pilot study was undertaken to determine the type of information necessary to facilitate goal setting. Second, three methods of goal setting, assigned, participative, and self-set, were tested to determine their effects on the goal attributes of acceptance, commitment, influence, and achieveability. Finally, the influence of the three methods of goal setting on adherence to physical activity and nutrition goals was tested. Due to the short time frame of this study, only adherence to short-term behavioural physical activity and nutrition goals was assessed. This study assessed overweight women as its population.

Methods

Pilot Study

A pilot study was conducted to test the questionnaires and the printed nutrition information to be used in the main study. The questionnaires were tested for readability and clarity. The nutrition information, which included brochures on fat, fibre, calcium, iron, eating on the run, eating breakfast, Canada's Food Guide to Healthy Eating, and reading food labels, were tested for appropriateness and adequacy.

Twenty women from a small rural community north of Edmonton, Alberta were recruited to take part in the pilot study. All of the women were recruited from a local walking program and/or a local T.O.P.S. (Take Off Pounds Sensibly) group. Upon arrival, all participants were introduced to the researcher (and her assistant) and were asked to complete a study consent form and two questionnaires; one questionnaire assessed present physical activity patterns and self-efficacy for certain physical activity and nutrition behaviours (SEE Appendix B) and the other questionnaire assessed present eating habits (SEE Appendix C). Along with these items, all participants were given a package of information containing the brochures listed above. While completing the questionnaires, participants were asked to indicate questions that were either hard to understand or were not clearly worded.

Upon completion of the consent form and questionnaires, the researcher gave an hour and a half presentation describing the information that would be found in the nutrition brochure package. Throughout the presentation, the researcher encouraged and answered any questions relating to either nutrition or physical activity. Every question

that was asked by participants was recorded so that the researcher gained an indication of the types of questions that may be asked in the main study. A small break was taken around the midpoint of the presentation.

After the presentation, participants were given a Goal Sheet to record their own personal goals (SEE Appendix D). After being given definitions, everyone was asked to set at least one short-term behavioural, one short-term outcome, one long-term behavioural, and one long-term outcome goal relating to both physical activity and nutrition. Upon completion of this task, participants were asked to complete one last questionnaire relating to their personal goals and the goal attributes of acceptance, commitment, influence, and achieveability (SEE Appendix F). Again, they were encouraged to point out any questions that were hard to understand or unclear. Prior to leaving, everyone was given a sample log book to record their success in meeting their listed goals (SEE Appendix G). In total, the pilot study took over three hours of the participants' time. Because the pilot study was used solely to test the questionnaires and the nutrition information, no follow-up was done to judge the success of the actual goal setting process.

Main Study

Participants.

Fifty-four women were recruited to participate in the present study. Participants were recruited through a variety of sources, including signs placed in well-trafficked areas of local fitness centres; in-class announcements at a University-run fitness and lifestyle program; advertisements on a local television segment reserved for individuals

and groups with non-profit causes; and an interview that aired on a local television stations' "Healthy Living" segment. All participants met the following criteria for inclusion in the study:

- Female;
- Between the ages of 25 and 60 years;
- Body Mass Index of at least 26;
- Struggle with weight loss for at least 5 years;
- No health conditions that could be affected by changes in diet and/or physical activity levels.

Procedure

Initial meetings.

Each participant was required to attend an initial meeting. This meeting was used to introduce the researcher to the participant, to complete consent forms (SEE Appendix A), and to gather information on each participants' present physical activity patterns, eating habits, and self-efficacy (for certain physical activity and nutrition behaviours). The initial meeting generally tended to be a group meeting, although, some initial meetings were held on an individual basis when scheduling difficulties applied.

Upon commencement of the initial meeting, the researcher described the study to the participants for a second time (the first time it was described was over the telephone when the participant was recruited). After answering any questions relating to the study, each participant was given two consent forms; one that was read, signed, dated, and given back to the researcher, and one that was kept by the participant. Participants were

informed verbally, and in writing on the consent form, that participation in this study was completely voluntary and that they were free to withdraw at any time without repercussions.

Next, the participants were asked to complete two questionnaires. The first questionnaire combined several different instruments and measured both current physical activity levels and self-efficacy. This questionnaire contained the Godin Leisure Time Physical Activity Questionnaire (Godin, Jobin & Bouillon, 1986) and the Godin & Shephard Leisure Time Physical Activity Questionnaire (Godin & Shephard, 1985). The relevant validity and reliabilities for these measures are reported in Godin et al. (1986) and Godin & Shephard (1985). As well, this questionnaire contained questions to measure self-efficacy for certain physical activity and nutrition behaviours (SEE Appendix B). This questionnaire also asked for personal information including address, phone number, age, marital status, and occupation. The second questionnaire was a Food Frequency Questionnaire that had previously been used in the Ontario Health Survey (SEE Appendix C). This questionnaire measured present eating habits. Instructions for completing both questionnaires were given verbally and in writing to all participants.

Upon completion of the questionnaires, participants were then given a package of nutrition information containing brochures on fat, fibre, calcium, iron, eating on the run, eating breakfast, Canada's Food Guide to Healthy Eating, and reading food labels. Participants were told that the information provided in the brochures would be used to set realistic and suitable goals. Therefore, all participants were asked to read this information (or at least "browse" through it) prior to the second meeting.

The final part of the meeting was spent answering any questions that participants had about the study. Prior to leaving, each participant scheduled a time for the second, individual goal setting meeting. In general, the initial meeting lasted no longer than one hour.

Individual Goal Setting Meetings.

Prior to the second meeting each participant was randomly assigned to one of the three goal setting conditions - assigned, participative, or self-set. Random assignment was done using a table that outlined subject numbers and a corresponding condition. The table was developed by first listing the subject numbers from 1 to 54.. Next, 54 labelled pieces of paper were placed in a hat (18 each with the labels "assigned," "participative," or "self-set"). As each piece of paper was pulled out of the hat, its label was assigned to the next subject number in line.

Thus, as each participant was scheduled for their second meeting, they were given a subject number that corresponded to one of the three conditions. None of the participants were told which condition they were in.

At the commencement of the second meeting, participants were given a Goal Sheet (SEE Appendix D) and were asked to follow along as definitions were given for the four types of goal categories that would be used when setting both physical activity and nutrition goals. These categories were short-term behavioural, short-term outcome, long-term behavioural and long-term outcome goals. Specific examples for physical activity and nutrition goals were given for each category. All participants were given the same definitions and examples in order to establish a certain degree of measurement

consistency and to help avoid confounding interpretations (Poag-DuCharme & Brawley, 1994). Along with these definitions and examples, participants were given a brief description of some of the characteristics their goals should have (i.e. their goals should be personal, specific, challenging, and achieveable).

Next, each participant was given a set of instructions for the goal setting process. The instructions given were based on a script that corresponded to whichever goal setting condition the participant was assigned to. Prior to commencement of this study, the researcher had generally memorized a set of three scripts - one for each condition (See Appendix E). Scripts were used to ensure that all information given to the participants remained consistent. What happened next in the goal setting meeting depended on whichever condition the participant was assigned to.

Goal Setting Conditions.

In the assigned goal setting condition, the researcher presented a set of goals to the participant. These goals were formulated by the researcher prior to the meeting and were written on the participants' Goal Sheet. Formulating the goals beforehand ensured that there was no input from the participant during the experimental condition. The goals that were assigned were as specific to the participant as possible. These goals were based on two things: (1) the physical activity and nutrition information gathered from the participant at the initial meeting and (2) current guidelines relating to physical activity (i.e. FITT formula and Active Living Guidelines) and nutritional behaviours (i.e. Canada's Food Guide to Healthy Eating).

After presenting the goals, the researcher then gave the participant an action plan.

This action plan contained statements that could help the participant reach their assigned physical activity and nutrition goals. For example, if one of the goals that was assigned was "to walk 3 times per week for at least 20 minutes" then a subsequent action plan might have included scheduling time for the walks and/or finding a partner to walk with. As with the assigned goals, this action plan was developed prior to the participants' individual goal setting meeting. During the assigned goal setting meeting, the researcher sat across the table from the participant.

In the participative goal setting condition, the researcher and the participant worked together to determine appropriate (difficult and achievable) physical activity and nutrition goals. In this condition, strong attempts were made to ensure that the researcher and the participant contributed equally to the setting of the goals. To facilitate a participative environment, the researcher and the participant both sat on the same side of the table. After discussing and agreeing upon each goal, it was recorded on the Goal Sheet. Once all the goals were completed, the researcher and the participant worked together to formulate an action plan, which was also recorded on the Goal Sheet.

In the self-set goal setting condition, the researcher sat across from the participant, explained the instructions for the goal setting process and then answered any questions that the participant had. The researcher then left the room while the participant developed her goals and action plan and recorded these on the Goal Sheet. The purpose of the researcher leaving the room was to restrict intervention and to make the lack of researcher involvement more salient to the participant (Fairall, 1993). Upon completion, the researcher returned to the room, reviewed the participants' goals and action plan and

acknowledged their acceptability. In some cases, the researcher had to ask the participant to rewrite some of her goals to make them more specific or realistic. For example, one woman self-set a goal "to be more active with my children." The researcher asked her to be more specific in stating what she meant by "more active." The participant than rewrote the goal to state "to go cycling or horseback riding with my children at least 2 times per week."

Follow-up Goal Setting Questionnaire.

Directly following the goal setting process, each participant was asked to complete a modified version of Brawley, Carron and Widmeyer's (1992) Group Goal Setting Questionnaire (SEE Appendix F). The group goals for this questionnaire were dropped as this study only involved the setting of individual goals. This questionnaire was chosen because it included the goal attributes, and because it has demonstrated favourable psychometric properties in previous research (Brawley et al., 1992).

To avoid confoundment, this questionnaire was administered to each participant by someone (usually a fellow graduate student) other than the researcher. The questionnaire administrator was instructed by the researcher to greet the participant, give them the questionnaire, and indicate that instructions were given for each section of the questionnaire. The administrator was then asked to collect the questionnaire upon its completion.

This questionnaire assessed the goal attributes of acceptance, commitment, influence, and achieveability as they related to the set short-term and long-term behavioural goals and the short-term and long-term outcome goals. All answers were

recorded directly on the questionnaire by the participant. Also included on this questionnaire were two questions that asked the participant who set their goals in the goal setting meeting and how much influence they had in setting their goals. These questions were used as a reliability check for the experimental conditions.

Measurement of Personal Goals.

In previous research, many people in assigned goal setting conditions have reported their own personal goals. Therefore, upon completion of the goal setting questionnaire, participants in the assigned condition were also given the opportunity to list any goals they personally had that pertained to physical activity and/or nutrition. Obviously, participants in the self-set and participative conditions were able to do this during their goal setting process, therefore, they were not asked to do this again.

Seven Day Physical Activity and Nutrition Logs.

Prior to leaving the goal setting meeting, each participant was given a log book (SEE Appendix G). This log book was used to record the extent to which the participant met their *short-term behavioural* goals for physical activity and their *short-term behavioural* goals for nutrition. Instructions for completing the log book were given to all participants. Specifically, everyone was told that the log book was not meant to give a detailed account of **all** physical activity participated in or **all** food consumed. Instead, relating to physical activity, the participant was asked to record each time, during the week, she did some form of physical activity that helped her to meet her short-term behavioural goals. Relating to nutrition, the participant was asked to record, on a daily basis, the extent to which she met her short-term behavioural nutrition goal(s). Along

with the log book, all participants were given a copy of their Goal Sheet, as well as, a self-addressed, stamped envelope to return their log book to the researcher.

Throughout all individual goal setting meetings, regardless of condition, the researcher maintained and encouraged a very supportive environment. This was achieved, in part, by listening to each persons' prior attempts (both positive and negative) at behaviour change and weight loss. Hearing each persons' successes and struggles allowed the researcher to better understand the complex issues surrounding many women who want to lose weight. Depending upon the amount of time spent in discussion, most goal setting meetings took between one and a half and two hours of the participants time.

One-week Follow-up Questionnaire.

Approximately 5 days after each participants' goal setting meeting, a follow-up questionnaire was sent to them via mail. Each participant was given instructions to complete the follow-up questionnaire immediately and return it with their completed log book in the envelope provided. The questionnaire included a number of instruments. Physical activity habits during the past seven days were assessed (along with their log book recordings) by the Godin & Shephard Leisure Time Physical Activity Questionnaire. As well, self-efficacy for certain physical activity and nutrition behaviours was reassessed using the same questions asked in the initial meeting. If the log books and one-week follow-up questionnaire were not mailed back within 2 to 3 weeks of the individual goal setting meeting, the researcher telephoned the participant to request that both be mailed back promptly. A maximum of three follow-up phone calls were made.

Measures

Pre-Measure of Physical Activity and Nutrition Habits.

Participants in the present study were asked to complete a number of questionnaires. The first two questionnaires pertained to the participants' present physical activity and eating habits. The Godin Leisure Time Physical Activity Questionnaire asked participants to indicate how often they engaged in any physical activity over the last 4 weeks and how often they *intended* to engage in physical activity over the next 4 weeks. Participants were given six responses to choose from; none, less than once a month, about once a month, about 2 to 3 times a month, about 1 or 2 times a week, and 3 times or more a week. The Godin & Shepard Leisure Time Physical Activity Questionnaire asked participants to indicate how many times per week they engaged in strenuous exercise, moderate exercise, and mild exercise. A Food Frequency Questionnaire was used to assess the types and serving sizes of foods participants had eaten over the last six to eight weeks. This questionnaire was very detailed, to the extent that it divided the same type of food into different varieties. Relating to milk , for example, participants indicated how much skim, 1%, 2% and homogenized milk they drank.

Goal Attributes - Group Goal Setting Questionnaire.

Following the individual goal setting meeting and pertaining to goal attributes, participants completed a modified version of Brawley et al.'s (1992) Group Goal Setting Questionnaire. Two questions were added to the beginning of this questionnaire. The first question asked "In the goal setting meeting you just came from, who set your

goals?" Participants were given the choices of "primarily you", "primarily the researcher", or "you and the researcher." The second question asked "Compared to the researcher, how much influence did you have in setting your goals?" Participants were asked to respond on a five point scale with 1 being "considerably less than" and 5 being "considerably more than."

The Group Goal Setting Questionnaire included similar assessments of individual and group goals. However, as the present study only considered individual goals, the "group" goals section of the questionnaire was dropped. The questionnaire used in this study, therefore, measured the goal attributes of acceptance, commitment, influence, and achieveability as they pertained to short-term behavioural, short-term outcome, long-term behavioural and long-term outcome physical activity and nutrition goals.

Goal acceptance was measured using a nine-point scale whereby participants indicated the extent to which they accepted their goals. Participants gave individual ratings for short-term behavioural, short-term outcome, long-term behavioural, and long-term outcome goals for both physical activity and nutrition (a total of eight responses).

Goal commitment was measured using a nine-point scale whereby participants indicated how personally committed they were to their short-term behavioural, short-term outcome, long-term behavioural, and long-term outcome goals for both physical activity and nutrition (a total of eight responses).

Goal influence was measured by a three-item question, using a nine-point scale. Participants were asked to rate their short-term behavioural, short-term outcome, long-term behavioural, and long-term outcome goals for both physical activity and nutrition on

the degree that they 1)helped them concentrate on what they were doing; 2) helped them try harder; and 3) helped them persist in what they did no matter what (a total of 24 responses).

Goal achieveability was measured using a nine-point scale whereby participants rated how achieveable they felt their goals were. Participants gave between one and five responses for each type of goal, depending on how many of each type of goal - short-term behavioural, short-term outcome, long-term behavioural, and long-term outcome for both physical activity and nutrition - were set (a total of between 8 and 40 responses).

Self-efficacy.

Pre- and post-measures for self-efficacy were taken for both physical activity and nutrition. For physical activity, participants completed a 16-item questionnaire where they were asked to rate, on a scale from 0 to 100, how confident they were in performing certain physical activity tasks (task efficacy), how confident they were in overcoming barriers to participating in physical activity (coping efficacy), and how confident they were in participating in physical activity a certain number of times per week (scheduling efficacy). An example question relating to task efficacy was "how confident are you that you can carry out your activity for the planned duration?" An example question for coping efficacy was "how confident are you that you can exercise when you are tired?" An example question pertaining to scheduling efficacy was "how confident are you that you can do 20 minutes of aerobic exercise like walking, cycling, or swimming twice per week for the next three months?"

For nutrition, participants completed a 12-item questionnaire where they were

asked to rate, on a scale from 0 to 100, how confident they were in performing certain nutrition behaviours (task efficacy), how confident they were in following the recommendations suggested in Canada's Food Guide to Healthy Eating (recommendation efficacy) and how confident they were in selecting certain foods over others (selection efficacy). An example question relating to task efficacy was "how confident are you that you can stop eating when you feel full?" An example question for recommendation efficacy was "how confident are you that you can eat 5 to 10 servings of vegetables and fruit daily?" An example question pertaining to selection efficacy was "how confident are you that you purchase low fat products instead of regular products more often when shopping?"

Post-Measure of Physical Activity and Nutrition Habits.

Prior to leaving their individual goal setting meeting, each participant was given a seven day log book with which to record everything they did to meet their *short-term behavioural* physical activity and nutrition goals. For physical activity, they recorded the type of activity they did, the time spent doing the activity, and the perceived intensity at which they performed the activity. As physical activity goals were typically weekly goals, it was not expected that each participant would record in their log book everyday. For nutrition, each participant recorded a simple description of what they did to meet their goals. As nutrition goals were typically daily goals, it was expected that they would record in their log everyday.

Physical activity habits were also measured with a questionnaire that was completed approximately 7 days after the individual goal setting meeting. This

questionnaire, the Godin & Shephard Leisure Time Physical Activity Questionnaire, is described above.

Data Analysis

Participation and Influence

Participation and influence were examined with cross tabulation analyses (x^2) because they were categorical variables. This analysis assesses the distribution of categorical responses within each group. A significant x^2 indicates that the distributions were not equal in all cells.

Goal Attributes

Each attribute was examined by between groups Analysis of Variance (ANOVA). Tukey's Least Significant Difference (LSD) post hoc tests were used to determine the source of any significant effects.

Prior to conducting the ANOVA for achieveability, the means of the participants' ratings for each type of goal were calculated (the participants could set up to five goals for each goal type for both physical activity and nutrition. Therefore, they could have up to five achieveability ratings for each goal type). This was done in an effort to look at overall goal achieveability. For example, if one participant set 2 short-term behavioural goals, 3 short-term outcome goals, 1 long-term behavioural goal, and 1 long-term outcome goal for physical activity, the number of ratings they gave for goal achieveability would have been 2, 3, 1, and 1, respectively. Therefore, the means of the ratings for each goal type were used to conduct the ANOVA for achieveability.

Self-Efficacy

Mixed model Multivariate Analysis of Variance (MANOVA) was used to examine self-efficacy. For exercise, there were four levels (types) of self-efficacy so a 4

(self-efficacy) X 3 (conditions) MANOVA with repeated measures on the first factor (self-efficacy) (because independence cannot be assumed) was performed. For nutrition, there were 3 types of self-efficacy so a 3 (self-efficacy) X 3 (conditions) MANOVA was conducted with repeated measures on the first factor. The mean of each type of efficacy for physical activity (coping I, task, scheduling and coping II) and nutrition (task, recommendation, and selection) was used in the analyses.

Adherence to Physical Activity and Nutrition Goals

A between groups ANOVA was performed to determine differences in self-reported levels of adherence. Prior to performing the ANOVA, the success rate for meeting the short-term behavioural physical activity and nutrition goals was determined. To do this, ratios for all goals that were set were calculated based on the number of times a certain behaviour was **achieved** divided by the **target** number of behaviours to be attempted for each goal. For example, if a participant had a **target** goal *to walk 3 times per week for 30 minutes each time* and they **achieved** this goal 2 times during their one-week logging time, the ratio of achieved/target for this goal would be 2/3. All ratios (up to five for short-term behavioural physical activity goals and five for short-term behavioural nutrition goals) were then converted to percents and the overall *mean* percentage for goals 1 to 5 was calculated for the physical activity and nutrition goals. It was these mean percentages that were used for the ANOVA.

Goal Content

Goal content was examined with cross tabulation analyses (x^2). In order to look at overall goal content, physical activity goals were divided into 4 categories; 1)

cardiovascular, 2) strength, 3) flexibility, and 4) other (which included relaxation goals, etc.). Nutrition goals were divided into 6 categories: 1) increase fruits and vegetables, 2) reduce fat, 3) reduce portions, 4) reduce snacking, 5) increase water, and 6) other (i.e. eat breakfast, increase fibre, stop eating after certain time, increase time spent for eating, increase variety, decrease coffee consumption, and increase vitamins).

Study Limitations

The researcher acknowledges the following list of the present study's limitations. Throughout the study, where possible, measures were taken to reduce or eliminate their effects.

1. Number of subjects: Preliminary results in a study by Kyllo and Landers (1995) found that research in the sport field has tested, on average, 26 subjects per cell compared to 43 subjects per cell in industrial and organizational research. These results suggested that the smaller sample sizes in exercise and sport research may reduce the chances of finding an effect. While this was recognized, unfortunately, the researcher had limited resources and was unable to increase the number of subjects in each condition.
2. Social Desirability: Participants in all three conditions may "read into" the study and try to give "desirable responses" to the questionnaire based on what they felt the researcher wanted to see. The researcher tried to limit these types of responses by emphasizing the importance of being as honest as possible.
3. Self-report: The questionnaires used relied primarily on self-report. For example, with the Food Frequency Questionnaire, participants were asked to remember the type of and amounts of foods they ate in the past 6 to 8 weeks. It is common for people to try to "look good" in the eyes of others. Therefore, responses to these questions may have been inflated/deflated. Again, to help reduce this limitation, the researcher stressed the importance of honesty.
4. Minimal subject involvement: As witnessed in previous studies, the researcher

recognized that many people do not understand the contribution they are making by completing questionnaires. As a result, participants in the present study may not have been willing to put the time or thought into their responses on the questionnaires. It was felt, however, that this limitation was minimized since involvement in the study was strictly voluntary.

5. Researcher participation: As the participants provided the information to set their goals (via completing the questionnaires at the initial meeting), they may not have recognized the extent of researcher participation in the goal setting process. Particularly, participants in the assigned condition may have felt they helped set their goals because they provided the information needed to set their goals and to make them personal.

Study Delimitations

The following is a list of study delimitations:

1. Study population: As with other areas of research, many goal setting studies have used subjects from high schools and universities, as these populations are typically more available. However, in order to broaden our knowledge base in this area, research should be extended to other demographic groups (Weinberg, 1994). The present study extended the research to study middle-aged females from a variety of different backgrounds.

2. Researcher consistency: Only one person, the researcher, was involved in the individual goal setting meetings with each participant. This ensured that a high

degree of consistency was maintained over all three conditions.

3. Random assignment: All participants were randomly assigned to one of the three goal setting conditions - participative, assigned, or self-set goal setting. Random assignment increased the validity of the study.

4. Study setting: Results of Kyllo and Landers' (1995) meta-analysis implied that goal setting leads to enhanced performance equally well whether tested in the field or in a laboratory setting. Additionally, they showed that study design characteristics did not radically alter the goal-setting effect. This gives support to this study as a quasi-experimental field study.

Results

Sample Characteristics

Participants for this study came from a wide variety of backgrounds and were of varying socio-economic status; some were unemployed while many were employed more than 40 hours per week. The participants also represented a full range of marital status; married, single, divorced, common law, or with a partner. The number of children each participant had varied from zero to four. Of the 54 participants that were recruited, five dropped out prior to completing the study.

Age and Body Mass Index.

Overall means were calculated for the ages and body mass indexes (BMI) of participants in all three conditions (assigned, participative, and self-set). No significant differences were found between conditions on either variables. Age of participants ranged from 25 to 57 years while body mass index ranged from 26 to 50. Table 1 shows the means for age and body mass index by condition. It should be noted that the n's vary throughout this table and those following it as incomplete data was given for some variables. Only those participants who gave complete data were used in the analyses.

Table 1
Means of Age and Body Mass Index by Goal Setting Method

	Condition		
	Assigned	Participatory	Self-set
Age - mean(SD)	39.8(10.0)	41.9(8.5)	46.4(7.4)
N	16	18	19
BMI - mean(SD)	31.9(4.7)	32.6(6.5)	32.0(3.3)
N	16	18	17

Effects of the Manipulation on Perceived Participation and Influence

A Chi Square test revealed a significant difference in the degree of participation between conditions; $x^2(4) = 27.34$, $p<.0001$ indicating that the distribution of responses was not equal in all the cells. Participants in the three conditions reported significant differences in the degree of participation in the goal setting process. Table 2 shows the crosstab count of participant responses to the above question.

Table 2
Perceived Participation in Goal Meetings

Who set goals?	Condition		
	Assigned n=16	Participatory n=17	Self-set n=17
Primarily participant	1	6	15
Primarily researcher	6	1	1
Participant and Researcher	9	10	1

Chi Square tests also showed a significant difference in the degree of influence people felt they had between the three conditions; $x^2(8) = 20.83$, $p<.05$. Participants in the three conditions reported significant differences in the degree of influence they had in setting their goals. Table 3 shows the crosstab count of participant responses to perceived influence.

Table 3
Perceived Influence in Goal Setting Meetings

	Condition		
Influence compared to researcher?	Assigned n=16	Participative n=16	Self-set n=17
Considerably less than	1	0	0
Less than	2	1	1
About the same	3	0	0
More than	7	6	1
Considerably more than	3	9	15

Goal Acceptance

A Multivariate Analysis of Variance (MANOVA) by condition found no significant differences between the three conditions on the degree of goal acceptance for any of the 4 types of goals set (short-term behavioural, short-term outcome, long-term behavioural, or long-term outcome) for both physical activity and nutrition. Table 4 shows the means and standard deviations for goal acceptance (maximum score of 9) based on the 4 types of physical activity and nutrition goals.

Table 4
Acceptance of Goals by Goal Setting Method

	Condition		
Goal type	Assigned n=15	Participative n=17	Self-set n=17
Physical Activity	mean(SD)	mean(SD)	mean(SD)
Short-term behavioural	8.7(.5)	8.6(.6)	8.7(.6)
Short-term outcome	8.9(.4)	8.4(.9)	8.7(.6)
Long term behavioural	8.0(1.1)	8.4(.8)	8.2(1.1)
Long-term outcome	8.5(.9)	8.7(.5)	8.4(.9)

Goal type	Condition		
	Assigned n=15	Participative n=17	Self-set n=17
Nutrition			
Short-term behavioural	8.1(1.1)	8.2(1.0)	8.3(.7)
Short-term outcome	8.7(.5)	8.2(1.1)	8.5(.7)
Long-term behavioural	8.5(.7)	8.4(.8)	8.2(.9)
Long-term outcome	8.7(.6)	8.7(.6)	8.4(.7)

Goal Commitment

A MANOVA by condition found no significant differences between the three conditions on the degree of goal commitment for any of the 4 types of goals set for both physical activity and nutrition. Table 5 shows the means and standard deviations for goal commitment (maximum score of 9) based on the 4 types of physical activity and nutrition goals.

Table 5
Commitment of Goals by Goal Setting Method

	Condition		
Goal type	Assigned n=16	Participative n=17	Self-set n=17
Physical Activity	mean(SD)	mean(SD)	mean(SD)
Short-term behavioural	8.5(.6)	8.7(.6)	8.7(.5)
Short-term outcome	8.7(.5)	8.7(.6)	8.7(.6)
Long term behavioural	8.3(.8)	8.7(.5)	8.3(.9)
Long-term outcome	8.6(.7)	8.7(.6)	8.4(.9)
Nutrition			
Short-term behavioural	8.3(.9)	8.5(.7)	8.6(.6)
Short-term outcome	8.5(.7)	8.5(.7)	8.7(.5)
Long-term behavioural	8.3(.9)	8.3(.9)	8.3(.9)
Long-term outcome	8.4(.9)	8.8(.6)	8.4(.8)

Goal Influence

A MANOVA by condition found no significant differences between the three conditions on the degree of goal influence for physical activity goals or nutrition goals. Table 6 shows the means and standard deviations for goal influence.

Table 6
Influence of Goals by Goal Setting Method

Goal type	Condition		
	Assigned n=15	Participative n=17	Self-set n=17
Physical Activity			
Short term behavioural:			
Concentrate	8.0(1.2)	7.3(1.3)	7.7(2.2)
Try Harder	8.1(1.1)	7.9(1.2)	7.6(2.1)
Persist	7.9(1.2)	7.5(1.4)	7.1(1.9)
Short-term outcome:			
Concentrate	7.9(1.0)	7.3(1.3)	7.7(2.0)
Try Harder	8.1(1.1)	7.8(1.4)	7.7(1.9)
Persist	8.0(1.0)	7.5(1.6)	7.3(2.0)
Long term behavioural:			
Concentrate	8.0(1.1)	7.2(1.2)	7.1(2.5)
Try Harder	8.4(.9)	7.8(1.3)	7.2(1.8)
Persist	7.8(1.4)	7.8(1.1)	6.8(1.9)
Long-term outcome:			
Concentrate	8.0(1.1)	7.4(1.3)	7.4(2.1)
Try Harder	8.1(1.1)	7.8(1.1)	6.8(2.6)
Persist	7.9(1.5)	7.8(1.2)	6.8(2.5)
Nutrition			
Short-term behavioural:			
Concentrate	8.1(.9)	8.2(1.0)	8.0(1.5)
Try Harder	8.2(1.1)	8.4(.8)	7.7(2.1)
Persist	8.1(1.1)	7.9(1.2)	7.4(2.0)
Short-term outcome:			
Concentrate	8.4(.7)	7.59(1.42)	7.7(1.9)
Try Harder	8.5(.7)	7.65(1.46)	7.4(2.3)
Persist	8.1(1.0)	7.76(1.35)	7.1(1.9)
Long-term behavioural:			
Concentrate	8.1(1.2)	7.7(1.5)	7.3(2.1)
Try Harder	8.3(1.0)	7.9(1.3)	6.8(2.4)
Persist	8.1(1.3)	7.7(1.5)	6.5(2.1)
Long-term outcome:			
Concentrate	8.1(1.1)	7.9(1.2)	7.2(2.1)
Try Harder	8.4(.9)	8.2(1.0)	6.5(2.7)
Persist	8.0(1.1)	8.1(.9)	6.7(2.3)

Goal Achieveability

A MANOVA by condition found no significant differences between the three conditions on the degree of goal achieveability for any of the 4 types of goals set for both physical activity and nutrition. Table 7 shows the means and standard deviations for goal achieveability.

Table 7
Achieveability of Goals by Goal Setting Method

	Condition		
Goal type	Assigned n=15	Participative n=17	Self-set n=17
Physical Activity	mean(SD)	mean(SD)	mean(SD)
Short-term behavioural	8.8(.5)	8.3(.6)	8.2(1.0)
Short-term outcome	8.5(.7)	7.8(1.1)	8.2(1.0)
Long term behavioural	7.9(1.1)	8.1(.6)	7.9(1.2)
Long-term outcome	8.3(1.1)	8.0(.8)	8.0(1.1)
Nutrition			
Short-term behavioural	8.1(.9)	8.2(.7)	8.2(.9)
Short-term outcome	8.4(.9)	8.1(.9)	7.9(1.3)
Long-term behavioural	8.3(.8)	7.8(1.1)	7.6(1.1)
Long-term outcome	8.3(1.0)	8.2(.6)	8.1(1.1)

Self-efficacy

Physical activity and nutrition self-efficacy were measured at the initial meeting and one week after the individual goal setting meeting. Aggregate variables for physical activity were constructed as follows: coping I efficacy, 4 items, Cronbach's alpha time 1 = .82, time 2 = .88, example "how confident are you that you can exercise when you are tired?"; task efficacy, 4 items, Cronbach's alpha time 1 = .79, time 2 = .87, example "how

confident are you that you can carry out your activity for the planned duration?"; scheduling efficacy, 4 items, Cronbach's alpha time 1 = .67, time 2 = .74, example "how confident are you that you can do 20 minutes of aerobic exercise like walking, cycling, or swimming twice per week for the next three months?"; coping II efficacy, 4 items, Cronbach's alpha time 1 & 2 = .90, example "how confident are you that you can overcome obstacles that prevent you from participating regularly?"

Aggregate variables for nutrition were constructed as follows: task efficacy, 3 items, Cronbach's alpha time 1 = .68, time 2 = .82, example "how confident are you that you can stop eating when you feel full?"; recommendation efficacy, 6 items, Cronbach's alpha time 1 = .66, time 2 = .85, example "how confident are you that you can eat 5 to 10 servings of vegetables and fruit daily?"; selection efficacy, 3 items, Cronbach's alpha time 1 = .67, time 2 = .83, example "how confident are you that you can purchase low fat products instead of regular products more often when shopping?".

A MANOVA with repeated measures was performed to determine whether there were any changes in self-efficacy scores from pre- to post-treatment. A main effect was found within subjects for time; $F(7,26) = 5.47$, $p=<0.05$. However, no main effect was found between subjects for condition and no main interaction was found within subjects for time by condition. Table 8 shows the means and standard deviations for self-efficacy pre- and post-treatment.

Table 8
Self-efficacy

Aggregate	Condition: Assigned n=7	Participative n=15	Self-set n=13
Physical Activity	mean(SD)	mean(SD)	mean(SD)
Coping I Efficacy			
pre	43.6(26.0)	58.2(20.7)	48.6(23.4)
post	56.1(20.7)	67.4(19.0)	60.0(24.2)
Task Efficacy			
pre	72.3(16.9)	77.6(16.6)	71.0(17.8)
post	76.6(14.6)	81.2(15.8)	78.9(15.6)
Scheduling Efficacy			
pre	83.0(11.8)	86.1(9.2)	79.9(18.6)
post	83.8(8.9)	88.2(14.8)	86.1(14.3)
Coping II Efficacy			
pre	72.3(14.5)	68.7(19.5)	64.8(22.8)
post	71.1(19.1)	72.2(17.8)	66.6(25.6)
Nutrition			
Task Efficacy pre			
post	65.7(17.4)	71.2(18.1)	72.7(23.3)
	76.9(16.1)	84.1(7.6)	78.1(21.0)
Recommendation Efficacy			
pre			
post	70.8(8.9)	72.5(12.2)	76.0(15.1)
	77.5(12.4)	85.6(9.3)	76.0(19.8)
Selection Efficacy			
pre	81.3(8.6)	80.8(18.7)	78.5(19.3)
post	83.1(8.0)	87.2(9.5)	76.4(22.0)

Table 9 shows the F values for the within subjects main effect for time. As can be seen self-efficacy tended to increase from pre- to post-goal setting.

Table 9
Self-efficacy for Time

Measure	F Value (1,32)
Physical Activity	
Coping I Efficacy	24.0*
Task Efficacy	3.8
Scheduling Efficacy	2.0
Coping II Efficacy	.3
Nutrition	
Task Efficacy	15.6*
Recommendation Efficacy	13.3*
Selection Efficacy	1.2

* p=<0.05

Adherence to Physical Activity and Nutrition Goals

An Analysis of Variance (ANOVA) was conducted to determine if, overall, any of the three conditions supported greater goal adherence. No significant differences were found between conditions for goal adherence. Table 10 shows the means and standard deviations for percentage of goals achieved for both physical activity and nutrition along with the range of goals achieved in percentage. It should be noted that it was possible for a participant to receive more than 100 percent on their adherence rating if they exceeded their goals (ie. Walked 4 times instead of their goal of 3 times per week).

Table 10
Percent of Physical Activity and Nutrition Goals Achieved

Goal Type	Condition: Assigned n=9	Participatory n=15	Self-set n=14
	mean(SD)	mean(SD)	mean(SD)
Physical Activity	92.8(39.0)	77.9(35.8)	78.8(42.8)
minimum %	33.3	25.0	18.3
maximum %	133.3	150.0	161.1
Nutrition	70.9(20.7)	74.7(13.0)	68.1(22.5)
minimum %	43.1	52.4	30.8
maximum %	100.0	93.6	103.3

Goal Content

Cross tabulation analyses were calculated to determine the types of short-term behavioural goals set during the individual goal setting meetings. Table 11 shows the number of goals set in each condition for each goal type along with the total number of goals set for each condition.

Table 11
Number and Category of Physical Activity and Nutrition Goals

Category of Goal	Condition: Assigned	Participatory	Self-set
Physical Activity			
Cardiovascular	8	19	18
Strength	2	7	6
Flexibility	1	4	4
Other	0	1	5
TOTAL	11	31	33

	Condition		
Goal type	Assigned n=15	Participative n=17	Self-set n=17
Nutrition			
Increase Fruits & Vegetables	5	8	14
Reduce Fat	0	3	4
Reduce Portions	2	3	2
Reduce Snacking	3	11	4
Increase Water	3	4	4
Other	12	26	15
TOTAL	25	55	43

There were no significant differences in the types of goals set in each condition, however, participants in the assigned condition did have fewer goals than participants in the participative or self-set conditions. The number of goals set in the assigned condition were based on what the researcher felt was achieveable for the participant. The higher number of goals in the participative and self-set condition, where the participant had influence, suggest that the participant felt they could achieve more goals.

Discussion

Age and Body Mass Index

Results of this study showed there were no significant differences between the participants in the three conditions in terms of age or body mass index. This suggests that results were not confounded by these variables.

Effects of the Manipulation

Significant differences in the degree of participation and the degree of influence between conditions indicates that the manipulation was successful and that the participants in the different conditions reported different experiences. This finding allowed for further investigation into the effects of the goal setting methods on various goal attributes and on goal adherence.

In looking at the crosstab calculations for both the perceived participation and the perceived influence in the goal meetings, it is interesting to note that a large percentage of participants in the assigned condition felt that they had an equal or greater degree of participation in setting and in influencing their goals. As well, a large percentage of women in the participative condition indicated that they had more, to considerably more, influence than the researcher in setting their goals. In discussions with the participants after the goal setting meeting, many of them verbally indicated that they felt they had a high degree of participation and influence in setting their goals because they had provided the initial information from which the goals were set.

Effects of Condition on Goal Attributes

Despite differential reports of the degree of participation in the conditions, there

were no significant differences in the degree of acceptance, commitment, influence, or achieveability of the goals. This finding is consistent with Fairall and Rodgers' (1997) findings on goal setting and track and field athletes and Dossett, Latham and Mitchells' (1979) findings on goal setting and female clerical personnel. The results of these studies, however, contrast the bulk of the literature on goal setting that indicates that participative goal setting is most effective (e.g. Erez & Kanfer, 1983; Latham & Yukl, 1976). The supportive environment offered in the present study and the above two listed studies may partially explain why the results of these studies vary from the bulk of the literature. The majority of studies in goal setting have taken place in industrial settings, and these studies have usually compared assigned goal setting (seen by employees as not supportive) to some form of participative goal setting (viewed as more supportive). In these studies, participative goal setting may have been shown to be more effective as employees generally prefer to be included in decisions that affect them (Cascio & Thacker, 1994).

The absence of significant differences between conditions may be explained by the setting in which the study took place and the nature of the subjects involved in the study. A large number of the studies reviewed took place in artificial environments (e.g. Weinberg, Bruya, & Jackson, 1985) or in organizational and industrial settings (e.g. Dossett et al., 1979). As well, the researchers conducting these studies developed tasks (goals) that were not necessarily considered "personal" for the participants (i.e. number of sit-ups one can do in a minute). The present study, like that of Fairall and Rodgers' (1997), provided a very supportive environment in which each person was treated

individually and goals that were set were personal and were based on specific information given by the participant (or about the participant, in the case of Fairall and Rodgers). As well, everyone in the present study agreed to participate because they wanted to make lifestyle changes that could lead to weight loss and better health. This differs from many of the studies conducted in organizational and industrial settings; the participants in these studies were not always given a choice as to whether or not they wanted to take part.

There are also several other possible explanations that may contribute to the nonsignificant findings for goal attributes by condition. First, efforts were made to find out as much information about the participants' present physical activity and nutrition habits. With this information, ensuring that appropriate and personal goals were set for each participant was relatively easy. Furthermore, it was expected that setting appropriate and personal goals would lead to a high degree of goal acceptance, commitment, influence, and achieveability, regardless of which condition the participant was in. Additionally, the researcher was very knowledgeable in the areas of physical activity and nutrition. Participants, then, would have viewed the researcher as highly educated and therefore would have trusted the suggestions given by the researcher (in the case of the participative and the assigned conditions). This, in turn, would have lead to positive ratings for the above goal attributes. Furthermore, in the case of those participants in the assigned condition, many people verbally indicated that the goals set by the researcher were similar to their personal goals. This further supports the high ratings for acceptance, commitment, influence, and achieveability from participants in the assigned condition.

It has been previously suggested that ratings of goal attributes may not differ by condition as long as a supportive environment is maintained throughout the goal setting intervention. In the present study, every effort was made to ensure that the participants felt comfortable and were supported during the goal setting meeting. As a result, many participants were able to talk freely about their particular life situations either at the initial meeting or at the individual meeting, prior to the goal setting procedure. Having a further understanding of the participant ensured that set goals were appropriate and personal.

Several observations were made by the researcher in the course of the meetings that are germane to this discussion.

1. Although the researcher was often able to gain pertinent information about the participant by reviewing the physical activity and nutrition information given and by speaking with the participant, this was not always the case. Because the participative group encouraged more interaction between the participant and the researcher, the researcher was able to gain a better understanding of people in this group compared to people in the assigned and self-set group. This supports Erez & Kanfer's (1983) statement that participation in decision making increases knowledge and understanding by providing information on a person-to-person level.
2. In the assigned group, most times the researcher set the goals for participants in this group without knowing any more information than that given from the physical activity and nutrition questionnaires. On several occasions, the researcher discovered that the goals that were set were not appropriate for reasons

such as special equipment or dietary needs. For example, one goal set by the researcher was "to have at least 2 servings from the milk products food group each day." This goal was set based on the fact that the participants' self-reported intake of foods in this group was limited, but without explanation. Upon further speaking to the participant, the researcher was informed that the person had a lactose intolerance and lactaid tablets were ineffective (due to the size of the person, she would have had to take 10-12 tablets with each serving. This was not suitable as the tablets often did not help and were too expensive). This example supports the need to develop even more indepth questionnaires to be reviewed prior to the goal setting meetings if the meetings are not participative.

This also pertains to contextual differences between home and lifestyle goal setting and industrial or sport context goal setting. In lifestyle goal setting, individual differences and the personal perspective are of greater influence and there are no group level "super ordinate" goals or social structures to contextualize the goals. The facts that an individual wears eye glasses or has food allergies, for example, are unlikely to influence behavioural strategies to improve performance at track practice or the number of words typed per minute in an office. These personal characteristics, however, are of tantamount importance in lifestyle planning (needing prescription swim goggles/contact lenses or meal planning). Thus the contextual influences within domains cannot be ignored in the developing of goal setting protocols.

3. In reviewing the mean scores for the goal attributes in tables 3 to 6, it appears that

there may be a ceiling effect going on. These high scores may reflect what participants thought were "socially desirable" responses. However, another explanation may be more valid. This population typically searches for any type of information that might help them in their quest for weight loss. Often, this population will try any product or service that is perceived to have even the slightest chance of success, and most have done so. Therefore, it is possible that they would be willing to try any goal, regardless of who set it, if there was a chance that it would help lead to weight loss. As well, participants have likely heard, through educational programs or other individuals, that a "lifestyle" approach to weight loss is the safest and most effective way to lose weight, feel better, and maintain weight loss. Therefore, it can be expected that participants would feel a high degree of goal acceptance, commitment, and influence. As well, many participants verbally commented after the goal setting meeting that this process was "the kick start they needed." Therefore, feeling highly motivated would help participants to view their goals as achieveable.

Goal Acceptance

Participants in all three conditions gave high acceptance ratings for all four types of goals. On a scale from 1 to 9, participants reported means of 8 or higher. Previous literature by Erez and Kanfer (1983) and Locke and Latham (1985) has suggested that goal acceptance is higher in participative and self-set conditions because of the greater degree of input by participants.

The present study did not support this literature as no differences were found

between the assigned, participative, and self-set conditions in the degree of goal acceptance for the four types of goals. The absence of significant differences may be partially explained by the fact that information about the participants' physical activity and nutrition habits was collected prior to the setting of goals. Therefore, any goals that were set were personal and appropriate, and thus, accepted.

These findings may be additionally explained by examining the nature of the women who participated in the study. Women wanting to lose weight are often willing to try anything that may help them to do so. This is witnessed by the multi-billion dollar industry that continues to prosper by selling "dieting aids" (Gaesser, 1996). Therefore, when a person educated in the areas of physical activity and nutrition suggests goals to try (as in the assigned condition), they likely would be highly accepting of these goals.

Goal Commitment

Regardless of the condition, results of the present study revealed that participants were highly committed to the goals that were established. On a scale from 1 to 9, participants reported means of 8.25 or higher for goal commitment. This result does not support the findings of Locke and Latham (1990) who reported higher commitment to goals with participative goal setting.

One possible explanation for the lack of significant differences between conditions relates to the high levels of motivation that many of the participants verbally expressed after the goal setting meeting. As with many weight loss programs, motivation to attempt and adhere to changes is usually high in the first few weeks of the program, however, both motivation and adherence usually decrease drastically after the first few

weeks or months (Dishman, 1988; Marcus & Stanton, 1993). With this population, a high degree of motivation could translate into a high degree of commitment, regardless of who set the goals.

Goal Influence

Results of the present study revealed that participants were highly influenced by the goals that were set, regardless of condition. On a scale from 1 to 9, all experimental conditions reported means of 6.79 or higher, with most scores being well over 7. Locke and Latham (1990) suggest that the relationship between commitment and behaviour is *mediated* by the way individuals perceive that their goals influence behaviour. Therefore, it is assumed that high scores on the commitment attribute would also translate into high scores for goal influence.

As well, many of the participants verbally indicated that setting goals motivated them to take action and to change their behaviour. Therefore, it can be assumed that a high degree of motivation would lead participants to concentrate more, try harder, and persist in meeting their goals.

Goal Achieveability

Regardless of condition, results revealed that participants felt that their goals were highly achieveable. On a scale from 1 to 9, all experimental conditions reported means of 7.75 or higher. Previous literature has suggested that goals should be specific in order to be achieveable (Locke and Latham, 1990). In all three conditions, the researcher ensured that the goals that were set were very specific (where appropriate). For example, short-term behavioural physical activity goals included the type of activity to be performed, the

intensity of the activity, the number of times per week the activity was to be performed, and the duration that the activity would be performed.

Self-efficacy

A main effect of time was found for self-efficacy suggesting that the goal setting meetings were effective in increasing the self-efficacy of participants in all three conditions. Self-efficacy is important as it indicates the degree of participants' confidence that they can perform the requisite behaviours to accomplish their goals. Self-efficacy increased in all three groups. However, there was no difference in self-efficacy conditions. This means that the three conditions did not differentially influence self-efficacy. As well, there was no time by condition interaction.

Adherence to Physical Activity and Nutrition Goals

No significant differences were found between conditions for adherence to physical activity or nutrition goals. This further supports the fact that how goals are set may not matter as long as a supportive environment is offered. Participants met their short-term behavioural physical activity goals 78% of the time or more and their short-term behavioural nutrition goals 68% of the time or more. This means all conditions enjoyed a high rate of success for adherence to the goals set. This lends further support to the technique of goal setting as an effective tool in motivating participants to change certain health behaviours, at least in the short-term.

There was, however, a lower rate of return on the log books by participants in the assigned goal setting condition. Only 9 of the 16 participants in the assigned group returned their log books compared to 15 of the 17 and 14 of the 16 participants in the

participative and self-set conditions, respectively. There was also greater variance in the reported adherence rates among the assigned participants who did return their log books. It is not possible to determine why there was reluctance to return the logs and greater variability in adherence in this group, but these findings, according to goal setting theory, suggest lower satisfaction and possibly success in this group (Locke & Latham, 1990).

In general, the mean scores for adherence to physical activity goals were somewhat higher than the mean scores for adherence to nutrition goals. This suggests that people were more successful in meeting their physical activity goals than their nutrition goals. This may be due to the fact that, overall, fewer physical activity goals were set than nutrition goals (i.e. fewer behavioural attempts required to be successful). It could be assumed that participants may be more successful in focussing on one or two goals compared to four or five goals. This is consistent with other research examining adherence where increased behavioural complexity is usually associated with worse adherence (Meichenbaum & Turk, 1987). It may also be reflective of contextual differences between behaviours required to achieve physical activity versus nutrition goals. Social aspects of eating behaviour are persuasive and difficult to assess. Also, particularly among women, the latter can be complicated by family responsibilities.

Goal Content

In general, it appears that fewer goals were set by the researcher for those participants in the assigned goal setting conditions. This is because the researcher is of the opinion that participants wishing to incorporate changes in physical activity and eating habits should do so slowly. It is well known that many people attempting to lose

weight tend to make several abrupt lifestyle changes in a short period of time. Initially, their motivation to achieve and maintain these changes is high, however, within a few short weeks, when life gets hectic, these changes decrease in importance. In the participative group, where more goals were set, the researcher was consistent in making sure that the participant felt that the goals set, and the overall number of goals, were all achieveable within the seven days following the individual goal setting meeting. It should also be noted that the assigned group, having the least amount of goals, reported the highest (though not significantly) adherence rates to physical activity goals suggesting that decreased behavioural complexity (i.e. number of changes required) is one possible explanation for their better performance.

The majority of the goals set involved improving cardiovascular fitness. This is probably because increases in aerobic activity are commonly believed to produce the greatest effects in terms of weight loss and the greatest reductions in risks for certain diseases.

Conclusions

Different forms of goal setting do not seem to have differential effects on goal attributes or self-reported adherence behaviour. The non-significant findings for goal attributes and adherence does not support the bulk of the research from the industrial and organizational settings. Empirically, it has been demonstrated that participative goal setting results in higher goal attribute scores and greater adherence in organizational settings. However, it is important to remember that goal setting is specific to the context in which it is researched. Furthermore, it has been previously demonstrated, and Locke and Latham (1990) have suggested, that theoretically there would be no advantage to any goal setting method as long as the environments are consistently supportive and adequate information was provided. The present results also demonstrate this finding. Therefore in the present study, where careful attention was paid to the maintenance of a supportive environment and information was shared between the participants and the researcher prior to the goal meetings, it is not surprising that there were no differences between groups. This supports the basic tenets of goal setting theory.

Applied Implications

The main rationale for conducting this study was to find the most effective goal setting method for use in physical activity, nutrition, and/or weight loss programs. As all 3 methods of goal setting - assigned, participative, and self-set - appear to produce positive results for goal attributes and adherence, it is perhaps more important to focus on fostering a supportive goal setting context. With this in mind, some recommendations for creating and sustaining a supportive environment are suggested:

1. Have trained and qualified staff members to teach people how to set appropriate physical activity and nutrition goals.
2. Have trained and qualified staff members who are able and willing to answer any questions participants may have.
3. Have trained and qualified staff members who are able to provide a supportive environment regardless of whether or not the person is successful in meeting their goals.
4. Staff members should take the time to periodically review each participant's goals to ensure that they are realistic and achieveable. Even when the importance of setting realistic and achieveable goals is stressed, this population may intentionally, or unintentionally, neglect the suggestions of the instructors. As well, it has been previously suggested that acceptance of and commitment to goals may depend on such things as supervision and supervisory expertise (In Latham & Yukl, 1976).

Considerations for Future Directions

As there appears to be very few published studies concerning goal setting and lifestyle behavioural changes, this would certainly be an area that future research should focus on, especially given today's growing emphasis on health promotion and illness prevention. Particularly, further research should be conducted on goal setting and its effects on goal attributes and goal adherence. The present study showed that different types of goal setting can produce similar effects in terms of ratings for goal attributes and adherence to physical activity and nutrition goals in a population of overweight women,

however this is only one in a dearth of studies that reported these findings.

If possible, future studies should also include more subjects. The present study involved only 54 participants as the researcher had limited resources. Future studies involving more participants would probably also need more than one researcher if individual goal setting meetings were held. Along with more participants, future studies should measure the effects of goal setting conditions on both short- and long-term adherence to "lifestyle" types of goals.

Given the "emotional" nature of issues surrounding weight loss, it is vitally important that researchers studying these areas have counselling training. Issues surrounding weight loss are very complex and many times participants wanting to lose weight suffer from depression and other manifesting psychological conditions. Researchers should also have training on ways to remain somewhat emotionally detached from their participants' lives.

One last suggestion for future research would be to study the inter- and intrapersonal aspects of goal setting in the social context of lifestyle behaviour change and to compare these with the inter- and intrapersonal aspects of goal setting in the contexts of changes in sport or industrial settings. For example, in sport settings, if an athlete does not achieve their goals, life often changes: the athlete may lose his/her spot on the team or they may not get played. In contrast, in a weight loss setting, if a person does not meet their physical activity and nutrition goals, life stays the same, at least in the short term.

Regardless of the specific direction that future research takes, it is clear that

further research needs to be conducted on goal setting and its potentially positive effects on health promotion. As previous research implies, there is a definite need to find effective methods to encourage people to make positive lifestyle changes that lead to health benefits. Goal setting has already been shown to be effective in motivating behaviour change, however, as previously stated, more research is needed to determine the specific mechanisms by which goal setting is most effective.

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APPENDIX A

CONSENT FORM

Consent Form

Project Title: Individual Goal Setting for Physical Activity and Nutrition

Principal Investigators: Patricia Dyck, 492-7424 and **Dr. Wendy Rodgers** (supervisor), 492-2677

The purpose of the present study is to examine methods of goal setting for physical activity and nutrition and their effects on goal characteristics and behaviour. It will include completing a number of questionnaires and taking part in a goal setting process. Your time will be distributed between an initial meeting, a goal setting process, and a follow-up meeting. The first meeting will take about 1 hour, the second meeting (goal setting process) will take about 1.5 hours, and the third meeting, one week later, will take about half an hour.

Regarding the goal setting process, all goals will be formulated with personal health and safety in mind (i.e. a person will not be allowed to set a goal that would not be endorsed by current practitioners in exercise and nutrition). The researcher will take any necessary precautions to ensure that all goals that are formulated are appropriate. When necessary individuals will be referred to their physicians for additional advice.

You are free to decline participation or to discontinue participation in this study at any time, for any reason, without prejudice or consequences. Your anonymity and confidentiality are guaranteed. The results of this study will not be released in any form in which you may be identified. All identifying information will be removed from the data upon receipt by the investigator. Only the above investigators will have access to the data. All data will be kept in a locked file cabinet in a limited access laboratory at the University of Alberta.

If you agree to participate, please complete the bottom portion of this form. If you have any questions regarding the project you may contact the above investigators or Dr. Jane Watkinson, Associate Dean of Graduate Studies and Research, Faculty of Physical Education and Recreation, 492-5910, who is not associated with this project.

I have read the paragraphs explaining the nature and procedures of the study conducted by Patricia Dyck, under the supervision of Dr. Wendy Rodgers, and I hereby consent to participate in the above mentioned study. I recognize that I am free to discontinue participation at any time without prejudice. I also acknowledge receiving a signed copy of this consent form.

Name _____ Date _____ Phone No. _____

Signature _____ Witness _____

APPENDIX B

PHYSICAL ACTIVITY AND SELF-EFFICACY QUESTIONNAIRE

Name: _____
Address: _____
_____
_____
Postal Code: _____

Phone Number: _____
Age: _____
Marital Status: _____
Occupation: _____

How often have you engaged in any physical activity over the last 4 weeks?	
None	
Less than once a month	
About once a month	
About 2 or 3 times a month	
About 1 or 2 times a week	
3 times or more a week	

How often do you *intend* to engage in physical activity over the next 4 weeks?	
None	
Less than once a month	
About once a month	
About 2 or 3 times a month	
About 1 or 2 times a week	
3 times or more a week	

The following questions ask you to recall your level of physical exercise over the past few weeks. Considering a typical week (7 days) how many times on the average did you do the following kinds of exercise for more than 20 minutes during your free time over the past few weeks (or over the past week when using this questionnaire as a post measure)?

When answering these questions please remember to:

- consider a typical or average week in the past few weeks.
- only count exercise sessions that lasted 20 minutes or longer in duration.
- only count exercise that was done during free time (i.e. not occupation or housework).
- note that the main difference between the three categories is the intensity of the activity.
- please write a number on each of the three lines for strenuous, moderate, and mild exercise after reading the descriptions of each.

Times per week

A. **STRENUOUS EXERCISE** (Heart beats rapidly, sweating)
(e.g. running, jogging, hockey, squash, soccer, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling, vigorous aerobic dance classes, heavy weight training) _____

B. **MODERATE EXERCISE** (Not exhausting, light perspiration)
(e.g. fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, dancing) _____

C. **MILD EXERCISE** (minimal effort, no perspiration)
(e.g. easy walking, yoga, archery, fishing, bowling, horseshoes, golf, snowmobiling) _____

Self-Efficacy

Physical Activity:

0% - 10 - 20 - 30 - 40 - 50 - 60 - 70 - 80 - 90 - 100% No Confidence Completely Confident		Confidence Level
How confident are you that you can exercise when you are:	Tired?	
	In a bad mood?	
	Feel you don't have time?	
	On vacation?	
How confident are you that you can:	Carry out your activity for the planned duration?	
	Check how hard your activity is making you work?	
	Pace yourself to avoid over-exertion?	
	Perform all the required movements?	
How confident are you that you can:	Take advantage of situations in the workday where you can increase your activity level - like taking the stairs instead of the elevator?	
	Do 20 minutes of aerobic exercise like walking, cycling, or swimming **once** per week for the next three months?	
	Do 20 minutes of aerobic exercise like walking, cycling, or swimming **twice** per week for the next three months?	
	Do 20 minutes of aerobic exercise like walking, cycling, or swimming **three times** per week for the next three months?	
	Overcome obstacles that prevent you from participating regularly?	
	Make up times you missed?	
	Make physical activity equal in importance to some of your other weekly activities?	
	Exercise regularly, no matter what?	

Eating Behaviours:

0% - 10 - 20 - 30 - 40 - 50 - 60 - 70 - 80 - 90 - 100% No Confidence Completely Confident		Confidence Level
How confident are you that you can:	Stop eating when you feel full?	
	Eat regular meals and snacks?	
	Eat breakfast daily?	
How confident are you that you can follow these *Canada's Food Guide to Healthy Eating* Recommendations:	Eat **5 - 12** servings of **grain products** (bread, cereal, pasta, rice, etc.) daily?	
	Eat **5 - 10** servings of **vegetables and fruit** daily?	
	Eat **3 - 4** servings of **milk products** daily?	
	Eat **2 - 3** servings of **meat & alternatives** (eggs, beans, tofu, peanut butter) daily?	
	Limit **"extras"** (sodas, deserts, condiments, chips, etc.)?	
How confident are you that you can:	Purchase low fat products instead of regular products more often when shopping (i.e. buy no fat salad dressing instead of regular salad dressing)?	
	Choose healthy selections from the menu when eating out at a restaurant (i.e. choose a baked potato instead of french fries)?	
	Drink **6 - 8** cups of water daily?	
	Choose higher fibre products (where applicable) when shopping (i.e. choose whole wheat bread instead of white bread)?	

APPENDIX C

FOOD FREQUENCY QUESTIONNAIRE

Part II

Food Intake

This part of the survey is designed to determine your usual food intake over the last 6 months. Complete the chart on the next pages including foods and beverages consumed both at home and away from home. Please read the items carefully and take your time filling in the chart.

For every food mark Yes or No. If Yes, indicate the number of times and mark day, week or month. Mark one of the serving sizes.

Here are some examples showing how to complete the chart.

"Sarah drinks 1% milk once a day - about 1 1/2 cups each time"
This is how she would show that on the chart

Examples

		Do you have this food or beverage at least once a month ?	About how many times per day or week or month?		About how much do you have each time?		
2.	1% milk and beverages made with it	✓ Yes → O No	1	✓ Day O Week O Month	O 1/2 cup	O 1 cup	✓ More than 1 cup

"Sarah eats whole wheat bread in a sandwich for lunch about five times a week, two slices each time." *She would record her bread this way.*

22.	Wholewheat or light rye bread and rolls	✓ Yes → O No	5	O Day ✓ Week O Month	✓ 1-2 slices	O 3-4 slices	O 5 or more slices

"Sarah only eats roast beef or steak every 3 or 4 months."
She would show that on the food chart like this.

27.	Beef and steak roasted or stewed	O Yes → ✓ No	—	O Day O Week O Month	O 4 ounces	O More than 4 ounces	O Less than 4 ounces

		Do you have this food or beverage at least once a month?	About how many times per day or week or month?		About how much do you have each time?	
White or Chocolate Milk To Drink						
1.	Skim milk and beverages made with it	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O 1 cup	O more than 1 cup
2.	1% milk and beverages made with it	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O 1 cup	O more than 1 cup
3.	2% milk and beverages made with it	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O 1 cup	O more than 1 cup
4.	Whole milk and beverages made with it	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O 1 cup	O more than 1 cup
5.	Milkshakes	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O 1 cup	O more than 1 cup
Cheese, Yogurt and Eggs							
6.	Hard cheese such as cheddar	O Yes → O No	___	O Day O Week O Month	O 1 inch cube	O More than 1 inch cube	O Less than 1 inch cube
7.	Skim milk cheese such as low fat mozzarella	O Yes → O No	___	O Day O Week O Month	O 1 inch cube	O More than 1 inch cube	O Less than 1 inch cube
8.	Processed cheese slices (including on sandwiches and hamburgers)	O Yes → O No	___	O Day O Week O Month	O 1 slice	O 2 slices	O more than 2 slices
9.	Cottage cheese	O Yes → O No	___	O Day O Week O Month	O 1/2 Cup	O More than 1/2 cup	O Less than 1/2 cup
10.	Low fat cottage cheese	O Yes → O No	___	O Day O Week O Month	O 1/2 Cup	O More than 1/2 cup	O Less than 1/2 cup

		Do you have this food or beverage at least once a month?	About how many times per day or week or month?		About how much do you have each time?		
11.	Any other cheese and cheese spreads	O Yes → O No	___	O Day O Week O Month	O 1 in. cube / 1 Tbsp.	O More than cube/Tbsp.	O Less than cube/Tbsp.
12.	Yogurt	O Yes → O No	___	O Day O Week O Month	O small carton	O large carton	O 1/2 cup
13.	Low fat yogurt	O Yes → O No	___	O Day O Week O Month	O small carton	O large carton	O 1/2 cup
14.	Eggs	O Yes → O No	___	O Day O Week O Month	O 1 egg	O 2 eggs	O 3 or more eggs

Breakfast Cereals

15.	Whole grain hot cereals (rolled oats, red river)	O Yes → O No	___	O Day O Week O Month	O 3/4 cup	O more than 3/4 cup	O less than 3/4 cup
16.	Instant hot cereals	O Yes → O No	___	O Day O Week O Month	O 3/4 cup	O more than 3/4 cup	O less than 3/4 cup
17.	Cold cereals, no sugar (Shredded Wheat, Corn Flakes, Rice Krispies, Cheerios)	O Yes → O No	___	O Day O Week O Month	O 3/4 cup	O more than 3/4 cup	O less than 3/4 cup
18.	Bran type cold cereals (Bran Flakes, All Bran Raisin Bran, etc.)	O Yes → O No	___	O Day O Week O Month	O 3/4 cup	O more than 3/4 cup	O less than 3/4 cup
19.	Sweetened cold cereals (Frosted Flakes, Sugar Smacks)	O Yes → O No	___	O Day O Week O Month	O 3/4 cup	O more than 3/4 cup	O less than 3/4 cup
20.	Granola	O Yes → O No	___	O Day O Week O Month	O 3/4 cup	O more than 3/4 cup	O less than 3/4 cup

21. **If you eat cereal**

a) Do you usually add sugar? O Yes O No
b) Do you usually add artificial sweetener? O Yes O No
c) Which one of the following do you use most often on your cereal?

O Cream/Half & Half O Whole milk O 2% milk O 1% milk O Skim milk

d) How much milk do you add to your cereal?

O 1/2 cup O 1 cup O more than 1 cup

		Do you have this food or beverage at least once a month?	About how many times per day or week or month?	About how much do you have each time?		
Breads, Rolls and Muffins						
22.	Wholewheat or light rye bread and rolls	O Yes → O No	___ O Day O Week O Month	O 1-2 slices	O 3-4 slices	O 5 or more slices
23.	Dark rye, pumpernickel fibre-enriched bread and rolls	O Yes → O No	___ O Day O Week O Month	O 1-2 slices	O 3-4 slices	O 5 or more slices
24.	White, Italian, French egg, raisin bread and rolls, bagels, hotdog or hamburger buns	O Yes → O No	___ O Day O Week O Month	O 1-2 slice	O 3-4 slices	O 5 or more slices
25.	Bran or corn muffins	O Yes → O No	___ O Day O Week O Month	O 1 muffin	O 2 muffins	O 3 or more muffins
26.	Any other muffins, such as blueberry, plain chocolate chip	O Yes → O No	___ O Day O Week O Month	O 1 muffin	O 2 muffins	O 3 or more muffins
27.	Pancakes or waffles	O Yes → O No	___ O Day O Week O Month	O 1	O 2	O 3 or more

28. **If you eat bread, do you add**

	Always	Usually	Sometimes	Rarely/Never
Butter, margarine or cream cheese	O	O	O	O
Diet margarine or cream cheese	O	O	O	O
Mayonnaise or salad dressing	O	O	O	O
Low calorie mayonnaise and dressing	O	O	O	O
Peanut butter	O	O	O	O
Jelly, jam, honey or other sweet spread	O	O	O	O

If you eat muffins, do you add

	Always	Usually	Sometimes	Rarely/Never
Butter, margarine or cream cheese	O	O	O	O
Diet margarine or cream cheese	O	O	O	O
Mayonnaise or salad dressing	O	O	O	O
Low calorie mayonnaise and dressing	O	O	O	O
Peanut butter	O	O	O	O
Jelly, jam, honey or other sweet spread	O	O	O	O

		Do you have this food or beverage at least once a month?	**About how many times per day or week or month?**	**About how much do you have each time?**		
Meat, Poultry, Fish and Alternatives						
29.	Beef and steak, roasted or stewed	O Yes → O No	___ O Day O Week O Month	O 4 ounces	O More than 4 ounces	O Less than 4 ounces
30.	Pork and pork chops, roasted or stewed	O Yes → O No	___ O Day O Week O Month	O 4 ounces	O More than 4 ounces	O Less than 4 ounces
31.	Fried or breaded beef, steak, pork pork and pork chops	O Yes → O No	___ O Day O Week O Month	O 4 ounces	O More than 4 ounces	O Less than 4 ounces
32.	Liver, any type	O Yes → O No	___ O Day O Week O Month	O 4 ounces	O More than 4 ounces	O Less than 4 ounces
33.	Chicken, turkey or other poultry, roasted, stewed or barbecued	O Yes → O No	___ O Day O Week O Month	O 1-2 slices	O 3-4 slices	O 5 or more slices

		Do you have this food or beverage at least once a month?	About how many times per day or week or month?		About how much do you have each time?		
34.	Fried chicken, nuggets, chicken sandwiches	O Yes → O No	___	O Day O Week O Month	O 2 pieces 6 nuggets 1 s'wich	O 4 pieces 9 nuggets 2 s'wich	O More than 4 pieces / 9 nuggets
35.	Fish, canned, fresh, frozen (ex. tuna salmon, sushi)	O Yes → O No	___	O Day O Week O Month	O 4 ounces	O More than 4 ounces	O Less than 4 ounces
36.	Fried fish, fried fish sandwiches	O Yes → O No	___	O Day O Week O Month	O 2 pieces 1 s'wich	O 4 pieces 2 s'wich	O more than 9 nuggets
37.	Hamburgers and cheeseburgers	O Yes → O No	___	O Day O Week O Month	O 4 ounces	O more than 4 ounces	O less than 4 ounces
38.	Wieners, hot dogs	O Yes → O No	___	O Day O Week O Month	O regular	O large/2 regular	O more than 1 large/2 reg.
39.	bacon	O Yes → O No	___	O Day O Week O Month	O 1-2 slices	O 3-4 slices	O 5 or more slices
40.	Sausages	O Yes → O No	___	O Day O Week O Month	O 1-2 links	O 3-4 links	O 1-2 large sausages
41.	Coldcuts, luncheon meats (bologna, salami, chicken loaf or ham)	O Yes → O No	___	O Day O Week O Month	O 1-2 slices	O 3-4 slices	O 5 or more slices
42.	Tofu, soy bean curd	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O more than 1/2 cup	O less than 1/2 cup

43.	Always	Usually	Sometimes	Rarely/Never
a) If you eat meat or chicken, do you add gravy?	O	O	O	O
b) If you eat meat, do you eat the fat?	O	O	O	O
c) If you eat chicken do you eat the skin?	O	O	O	O
d) If you eat fish, do you have tartar sauce or mayonnaise with it?	O	O	O	O

		Do you have this food or beverage at least once a month?	About how many times per day or week or month?		About how much do you have each time?		
Mixed meat, fish or chicken dishes							
44.	Meat and chicken pies	O Yes → O No	___	O Day O Week O Month	O 1-2 slices	O 3-4 slices	O 5 or more slices
45.	Any other mixed dishes made with ground meat, chicken and fish	O Yes → O No	___	O Day O Week O Month	O 1 cup	O more than 1 cup	O less than 1 cup
46.	Spaghetti, lasagna, other pasta with meat-tomato sauce	O Yes → O No	___	O Day O Week O Month	O 1 cup	O more than 1 cup	O less than 1 cup
47.	Macaroni and cheese, other pasta dishes with cheese	O Yes → O No	___	O Day O Week O Month	O 1 cup	O more than 1 cup	O less than 1 cup
48.	Pizza	O Yes → O No	___	O Day O Week O Month	O 1-2 slices	O 3-4 slices	O 5 or more slices
49.	Any other pasta or noodles	O Yes → O No	___	O Day O Week O Month	O 1 cup	O more than 1 cup	O less than 1 cup
50.	Rice, any type	O Yes → O No	___	O Day O Week O Month	O 1 cup	O more than 1 cup	O less than 1 cup
Soups							
51.	Vegetable or noodle-type soup	O Yes → O No	___	O Day O Week O Month	O 1 cup	O more than 2 cups	O less than 2 cups
52.	Cream-type soup	O Yes → O No	___	O Day O Week O Month	O 1 cup	O more than 2 cups	O less than 2 cups

		Do you have this food or beverage at least once a month?	About how many times per day or week or month?		About how much do you have each time?		
Vegetables							
53.	Broccoli	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O more than 1/2 cup	O less than 1/2 cup
54.	Carrots	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O more than 1/2 cup	O less than 1/2 cup
55.	Corn	O Yes → O No	___	O Day O Week O Month	O 1/2 cup small cob	O more than 1/2 cup	O less than 1/2 cup
56.	Green Peas	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O more than 1/2 cup	O less than 1/2 cup
57.	Greens (spinach, kale, bok choy, leeks)	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O more than 1/2 cup	O less than 1/2 cup
58.	Green beans, string beans, yellow beans	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O more than 1/2 cup	O less than 1/2 cup
59.	Any other beans, peas lentils (lima beans, navy, baked, pork and beans, kidney beans)	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O more than 1/2 cup	O less than 1/2 cup
60.	Potatoes, baked, salad, boiled	O Yes → O No	___	O Day O Week O Month	O 1 cup	O more than 1 cup	O less than 1 cup
61.	French fries, home fries, pan fried potatoes hash browns	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O more than 1/2 cup	O less than 1/2 cup
62.	Squash, all types	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O more than 1/2 cup	O less than 1/2 cup
63.	Salad - combination lettuce and tomato	O Yes → O No	___	O Day O Week O Month	O 1 cup	O more than 1 cup	O less than 1 cup

		Do you have this food or beverage at least once a month?	About how many times per day or week or month?		About how much do you have each time?		
64.	Any other salads such as coleslaw, carrot, bean, spinach	O Yes → O No	___	O Day O Week O Month	O 1 cup	O more than 1 cup	O less than 1 cup
65.	Any other vegetables such as cabbage, Brussels sprouts	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O more than 1/2 cup	O less than 1/2 cup

66.	Always	Usually	Sometimes	Rarely/Never
a) If you eat potatoes or rice do you add				
• butter, margarine, gravy or sour cream?	O	O	O	O
• diet margarine, defatted gravy or diet sour cream?	O	O	O	O
b) If you eat vegetables, do you add				
• butter, margarine, cheese or other sauces?	O	O	O	O
• diet margarine, low fat cheese sauces?	O	O	O	O
c) If you eat salads, do you add				
• regular mayonnaise, salad dressing or salad oil?	O	O	O	O
• diet, low fat, low calorie dressing or mayonnaise?	O	O	O	O

Fruit

67.	Apples, applesauce	O Yes → O No	___	O Day O Week O Month	O 1 apple/ 1/2 cup	O 2 apples/ 1 cup	O More than 2 apples/2 cups
68.	Bananas	O Yes → O No	___	O Day O Week O Month	O 1 banana	O 2 bananas	O 3 or more bananas
69.	Oranges, grapefruit	O Yes → O No	___	O Day O Week O Month	O 1 orange 1/2 g'fruit	O 2 oranges 1 g'fruit	O more than 3 oran./1 g'fruit
70.	Pears, peaches, nectarines, grapes plums	O Yes → O No	___	O Day O Week O Month	O 1 fruit 1/2 cup	O 2 fruit 1 cup	O more than 3 fruit/2 cups
71.	Raisins, prunes other dried fruit	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O 1 cup	O more than 1 cup

		Do you have this food or beverage at least once a month?	About how many times per day or week or month?		About how much do you have each time?		
72.	Cantaloupe	O Yes → O No	___	O Day O Week O Month	O less than 1/4 melon	O 1/4 melon	O more than 1/4 melon
73.	Any other fruit, including berries, fruit cocktail and salad	O Yes → O No	___	O Day O Week O Month	O 1 fruit 1/2 cup	O 2 fruit 1 cup	O more than 2 fruit/2 cups
Beverages							
74.	Orange juice and other citrus juices	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O 1 cup	O more than 1 cup
75.	Apple and other juices	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O 1 cup	O more than 1 cup
76.	Tomato, mixed vegetable juices	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O 1 cup	O more than 1 cup
77.	Fruit drinks such as Tang or Kool-Aid	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O 1 cup	O more than 1 cup
78.	Regular soft drinks (*NOT* diet)	O Yes → O No	___	O Day O Week O Month	O small or 1 can	O medium	O large
79.	Diet soft drinks	O Yes → O No	___	O Day O Week O Month	O small or 1 can	O medium	O large
80.	Beer, wine or liquor	O Yes → O No	___	O Day O Week O Month	O 1 glass wine or 1 can beer or 1 oz liquor	O *more* than 1 glass wine or 1 can beer or 1 oz liquor	O *less* than 1 glass wine or 1 can beer or 1 oz liquor
81.	Coffee	O Yes → O No	___	O Day O Week O Month	O 1 cup	O 2 cups	O 3 or more cups

82.	Tea	O Yes → O No	___	O Day O Week O Month	O 1 cup	O 2 cups	O 3 or more cups

83. If you drink coffee
   a) Do you add sugar? O Yes O No
   b) Which ONE of the following do you use most often?
   O No milk or cream O Cream or whole milk O 2% milk O 1% milk O Skim milk

84. If you drink tea
   a) Do you add sugar? O Yes O No
   b) Which ONE of the following do you use most often?
   O No milk or cream O Cream or whole milk O 2% milk O 1% milk O Skim milk

		Do you have this food or beverage at least once a month?	About how many times per day or week or month?		About how much do you have each time?		
Dessert and Snacks							
85.	Ice cream, ice milk, sherbet, frozen yogurt	O Yes → O No	___	O Day O Week O Month	O 1 scoop	O 2 scoops	O 3 or more scoops
86.	Cake	O Yes → O No	___	O Day O Week O Month	O 1 slice	O 2 slices	O 3 or more slices
87.	Pie	O Yes → O No	___	O Day O Week O Month	O 1 slice	O 2 slices	O 3 or more slices
88.	Cookies	O Yes → O No	___	O Day O Week O Month	O 1-5	O 5-10	O more than 10
89.	Crackers, Ritz, cheese-type, Triscuits	O Yes → O No	___	O Day O Week O Month	O 1-5	O 5-10	O more than 10
90.	Donuts, danish croissant	O Yes → O No	___	O Day O Week O Month	O 1	O 2	O 3 or more

		Do you have this food or beverage at least once a month?	About how many times per day or week or month?		About how much do you have each time?		
91.	Potato chips	O Yes → O No	___	O Day O Week O Month	O small bag	O more than small bag	O less than small bag
92.	Popcorn	O Yes → O No	___	O Day O Week O Month	O 2 cups	O more than 2 cups	O less than 2 cups
93.	Peanuts, other nuts seeds	O Yes → O No	___	O Day O Week O Month	O 1/2 cup	O more than 1/2 cup	O less than 1/2 cup
94.	Chocolate	O Yes → O No	___	O Day O Week O Month	O regular bar	O large bar	O 2 pieces

		Do you use at least once a month ?	About how many capsules or tablets per day, week or month?	
95.	Vitamin/mineral supplements	O Yes → O No	___	O Day O Week O Month

APPENDIX D

GOAL SHEET

GOAL SHEET

Part I. Exercise Goals

For each category of goal list as few as one (1) or as many as five (5) goals. These may include goals to increase cardiovascular fitness, improve technique, increase strength, increase flexibility, increase endurance, etc. Be as specific as possible.

A. ***Short-term Behavioural Goals*** - For example, *To run three times per week for 15 minutes.*

1. _____
2. _____
3. _____
4. _____
5. _____

B. ***Short-term Outcome Goals*** - For example, *To increase energy.*

1. _____
2. _____
3. _____
4. _____
5. _____

C. ***Long-term Behavioural Goals*** - For example, *To run five times per week for 45 minutes each time.*

1. _____
2. _____
3. _____
4. _____
5. _____

D. ***Long-term Outcome Goals*** - For example, *To reduce blood pressure.*

1. _____
2. _____
3. _____
4. _____
5. _____

Part II. Nutrition Goals

For each category of goal list as few as one (1) or as many as five (5) goals. These may include goals relating to water consumption, fibre consumption, fat consumption, fast-food consumption, consumption of specific foods, supplement consumption, etc. Again, be as specific as possible.

A. ***Short-term Behavioural Goals*** - For example, *To have one serving of fruit with breakfast everyday.*

1. _____
2. _____
3. _____
4. _____
5. _____

B. ***Short-term Outcome Goals*** - For example, *To increase energy.*

1. _____
2. _____
3. _____
4. _____
5. _____

C. ***Long-term Behavioural Goals*** - For example, *To eat 5 to 10 high-fibre fruits and vegetables each day.*

1. _____
2. _____
3. _____
4. _____
5. _____

D. ***Long-term Outcome Goals*** - For example, *To feel healthier.*

1. _____
2. _____
3. _____
4. _____
5. _____

Part III. Action Plans

A. ***Physical Activity Action Plan***

The following is my action plan to reach the above listed physical activity goals:

B. ***Nutrition Action Plan***

The following is my action plan to reach the above listed nutrition goals:

Part IV. Personal Goals

Please list any goals that you personally would like to strive for that are not outlined on your Goal Sheet.

A. **Personal Physical Activity Goals**

B. **Personal Nutrition Goals**

APPENDIX E

GOAL SCRIPTS

Goal Setting Script (Assigned)

We use Goal Sheets to record your goals for exercise and nutrition. (The participant is given a copy of the Goal Sheet that the researcher completed prior to the meeting). In my best estimation, these are the goals that **I think are appropriate for you**. Based on the information you provided in the Minnesota Leisure Time Physical Activity Questionnaire and the Food Frequency Questionnaire, these are the goals that **I feel** you can attain. **I would like** you to take these goals on as your challenges.

Now, the first set of goals I will give you will relate to physical activity. I will suggest both short-term and long-term goals. Short-term physical activity goals are achievable within the next week while long-term physical activity goals may take several weeks to accomplish.

First of all, this is what **I believe** are good short-term *behavioural* goals for you. (The researcher tells the participant each goal while the participant follows along on the Goal Sheet).

Second, **I think appropriate** short-term *outcome* goals for you are... (again, the researcher tells the participant each goal). Any questions?

Third, **I believe reasonable** long-term *behavioural* goals for you are... (the researcher tells the participant each goal).

Fourth, **I feel that attainable** long-term *outcome* goals for you are... (again, the researcher tells the participant each goal).

Now, the next set of goals I will give you relate to nutrition behaviours. Again, I will suggest both short-term and long-term goals. Short-term nutrition goals are achievable on a daily basis while long-term nutrition goals may take several weeks to accomplish. Any questions?

First, this is what **I believe** are good short-term *behavioural* goals for you. (The researcher tells the participant each goal while the participant follows along on the Goal Sheet).

Second, **I think appropriate** short-term *outcome* goals for you are... (again, the researcher tells the participant each goal). Any questions?

Third, **I believe reasonable** long-term *behavioural* goals for you are... (the researcher tells the participant each goal).

Fourth, **I feel that attainable** long-term *outcome* goals for you are... (again, the researcher tells the participant each goal). Do you have any questions?

Okay, in order to achieve these goals, you must have an **Action Plan**. **I would like you** to... (The researcher then goes through the action plan with the participant). Any questions?

NOTES: Supportiveness is maintained while giving the goal setting instructions. As well, if questions are asked during the instructions, the instructions will be stated in a different manner. At no time will the participant be allowed to intervene with the goals being assigned).

Goal Setting Script (Participative)

(Chairs should be situated on the same side of the table so that the researcher and the participant look at and fill out the Goal Sheet **together**).

We will use Goal Sheets to record your goals for exercise and nutrition (The researcher hands the participant a Goal Sheet). **We will** go through this exercise **together** and **we will** establish goals that **we both** believe are appropriate for you. With each goal type, we will establish at least one goal. **We will** spend approximately the next 30 minutes formulating your goals.

Now, Part I of the Goal Sheet entails **us filling out** your short-term and your long-term physical activity goals. Short-term physical activity goals are achievable within the next week while long-term physical activity goals may take several weeks to accomplish.

First, I would like **us** to set what we believe are appropriate short-term *behavioural* goals relating to physical activity. These may include goals to increase cardiovascular fitness, improve technique, increase strength, increase flexibility, increase endurance, etc. (Behavioural goals should be as specific as possible). An example of a short -term behavioural goal is *To run three times per week for 15 minutes*. Do you have any questions? (The participant will then consider short-term behavioural goals and the researcher will make changes or recommendations with rationale. The agreed upon goal(s) will then be recorded on the Goal Sheet).

Second, I would like **us** to record what we think are appropriate short-term *outcome* goals relating to physical activity. For example, one short-term outcome goal might be *To increase energy*. Your behavioural goal can help you achieve this. Remember short-term physical activity goals reflect what you want to do within the next week. (Again, the participant considers short-term outcome goals and the researcher makes changes or recommendations with rationale. The goals are then recorded on the Goal Sheet).

Third, I would like **us** to record what we think are appropriate long-term *behavioural* goals; what behavioural goals do you want to reach in the next several weeks? Relating to the previous goals, an example of a long-term behavioural goal might be *To run five times per week for 45 minutes each time*. Do you have any questions? (The participant and the researcher work together to formulate a goal(s) and record this/these on the Goal Sheet).

Fourth, I would like **us** to record what we think are appropriate long-term *outcome* goals. Your long-term outcome goals can relate to your other short-term and long term goals. For example, one long-term outcome goal might be *To decrease blood pressure*. (Again, long-term outcome goals are collectively established by the participant and the researcher and they are recorded on the Goal Sheet).

Now, Part II of the Goal Sheet entails **us filling out** your short-term and your long-term nutrition goals. Short-term nutrition goals are achievable on a daily basis while long-term nutrition goals may take several weeks to accomplish.

First, I would like **us** to record what we believe are appropriate short-term *behavioural* goals relating to nutrition. These may include goals relating to water consumption, fibre consumption, fat consumption, fast-food consumption, consumption of specific foods, supplement consumption, etc. Again, your behavioural goals should be as specific as possible. An example of a short-term behavioural goal for nutrition might be *To have one serving of fruit with breakfast everyday*. (The participant and the researcher formulate at least one short-term

behavioural nutrition goal together and record this on the Goal Sheet).

Second, I would like **us** to record what we think are appropriate short-term *outcome* goals relating to nutrition. For example, one short-term outcome goal might be *To increase energy.* (Short-term outcome goals are discussed and recorded on the Goal Sheet).

Third, I would like **us** to formulate what we think are appropriate long-term *behavioural* goals for nutrition. Relating to the previous goals, an example of a long-term behavioural goal might be *To eat 5 to 10 high-fibre fruits and vegetables each day.* (Again, this is discussed and at least one long-term behavioural goal is recorded on the Goal Sheet).

Fourth, I would like **us** to decide what we think are appropriate long-term *outcome* goals. For example, one long-term outcome goal might be *To feel healthier.* (These are discussed and recorded).

Now, in order to achieve these goals, you must have an **Action Plan**. In Part II, **we will** plan how you will achieve the physical activity goals and the nutrition goals we have just recorded. To achieve your goals, your action plan may include scheduling time out, getting the appropriate equipment, soliciting support from family and/or friends, regular outings to the grocery store, ways of rewarding yourself, etc. (The participant and the researcher collectively complete an action plan to meet the goals. This plan is recorded on the Goal Sheet).

NOTES: Supportiveness is maintained throughout the goal setting meeting. Again, in this goal setting condition, goals must be established in agreement with the participant and the researcher through discussion. Together, the participant and the researcher determine the goals.

Goal Setting Script (Self-Set)

You will use Goal Sheets to record your goals for exercise and nutrition. Relating to physical activity and nutrition, I would like **you** to carefully think about appropriate short-term and long-term goals. I would then like **you** to complete this Goal Sheet. (The participant is given the Goal Sheet to follow as instructions are provided).

In Part I, **I would like you** to fill out **your short-term** and **your long-term physical activity goals.** Short-term physical activity goals are achievable within the next week while long-term physical activity goals may take several weeks to accomplish.

First, I would like **you** to record what you believe are appropriate short-term *behavioural* goals relating to physical activity. These may include goals to increase cardiovascular fitness, improve technique, increase strength, increase flexibility, increase endurance, etc. Your behavioural goals should be as specific as possible. For example, if you wish to increase your endurance, state the method you wish to use and how often you will do it. An example of a short -term behavioural goal is *To run three times per week for 15 minutes*. Do you have any questions?

Second, I would like **you** to record what you think are appropriate short-term *outcome* goals relating to physical activity. For example, one short-term outcome goal might be *To increase energy*. Your behavioural goal can help you achieve this. Remember short-term physical activity goals reflect what you would like to do in the next week.

Third, I would like **you** to record what you think are appropriate long-term *behavioural* goals; what behavioural goals do you want to reach in the next several weeks? Relating to the previous goals, an example of a long-term behavioural goal might be *To run five times per week for 45 minutes each time.* Do you have any questions?

Fourth, I would like **you** to record what you think are appropriate long-term *outcome* goals. Your long-term outcome goals can relate to your other short-term and long term goals. For example, one long-term outcome goal might be *To decrease blood pressure.*

In Part II, **I would like you** to fill out **your short-term** and **your long-term nutrition goals.** Short-term nutrition goals are achievable on a daily basis while long-term nutrition goals may take several weeks to accomplish. Part II is asking you to do the same as Part I, however, in Part II you will focus on nutrition goals and not on physical activity goals.

First, I would like **you** to record what you believe are appropriate short-term *behavioural* goals relating to nutrition. These may include goals relating to water consumption, fibre consumption, fat consumption, fast-food consumption, consumption of specific foods, supplement consumption, etc. Again, your behavioural goals should be as specific as possible. For example, if you wish to increase fruit consumption, state the method you wish to use to do this and how much you want to increase it by/to. An example of a short-term behavioural goal for nutrition, therefore, might be *To have one serving of fruit with breakfast everyday.* Do you have any questions?

Second, I would like **you** to record what you think are appropriate short-term *outcome* goals relating to nutrition. For example, one short-term outcome goal might be *To increase energy.*

Third, I would like **you** to record what you think are appropriate long-term *behavioural* goals for nutrition. Relating to the previous goals, an example of a long-term behavioural goal might be *To eat 5 to 10 high-fibre fruits and vegetables each day.* Do you have any questions?

Fourth, I would like **you** to record what you think are appropriate long-term *outcome*

goals. For example, one long-term outcome goal might be *To feel healthier.* In summary, I would like you to list at least ONE short-term behavioural goal, ONE short-term outcome goal, ONE long-term behavioural goal, and ONE long-term outcome goal relating to both physical activity and nutrition. As in the above examples, each goal can relate to the others, however, it does not have to. You can list up to five physical activity and nutrition goals in each section. Do you have any questions?

Now, in order to achieve these goals, you must have an **Action Plan**. In Part III, I would like **you** to plan how you wish to achieve the physical activity goals and the nutrition goals you have listed. To achieve your goals, your plan may include scheduling time out, getting the appropriate equipment, soliciting support from family and/or friends, regular outings to the grocery store, ways of rewarding yourself, etc. Any questions?

Okay, if there are no more questions and you fully understand what is being asked of you, I will leave you to work on this. I will return in approximately 30 minutes. If you complete the Goal Sheet and Action Plan before I return, you can look at these magazines I have provided.

NOTES: Supportiveness is maintained while giving the goal setting instructions. As well, if questions are asked during the instructions, the instructions will be stated in a different manner. At no time will any information be provided relating to specific goals the participant hopes to set.

APPENDIX F

FOLLOW-UP GOAL SETTING QUESTIONNAIRE

Name: _____

Goal Setting Questionnaire - Goal Attributes

In the goal setting meeting you just came from, who set your goals? (Please circle one)

Primarily you Primarily the researcher You and the researcher

Use the scale below to answer the following question. Compared to the researcher, how much influence did you have in setting your goals? (Please circle one number)

1	2	3	4	5
Considerably less than		50%		Considerably more than

Please follow the directions given in each of the following sections of this questionnaire. Refer to, and think about, the goals on your GOAL SHEET when answering the following questions.

GOAL ACCEPTANCE

Goal acceptance is the extent to which a person favourably receives or accepts a goal. Sometimes people accept some of their goals more than others. That is, they see them as more or less valid. On a scale from 1 to 9, please indicate **the extent to which you accept your goals.**

1	2	3	4	5	6	7	8	9
No acceptance								Complete acceptance

Physical Activity Goals:	**Acceptance Level**
1. Short-term Behavioural Goal(s)	_____
2. Short-term Outcome Goal(s)	_____
3. Long-term Behavioural Goal(s)	_____
4. Long-term Outcome Goal(s)	_____
Nutrition Goals:	
5. Short-term Behavioural Goal(s)	_____
6. Short-term Outcome Goal(s)	_____
7. Long-term Behavioural Goal(s)	_____
8. Long-term Outcome Goal(s)	_____

GOAL COMMITMENT

Goal commitment is defined as the extent to which a person is dedicated to a goal. Please use the following scale to answer the next set of questions. Place the value from the scale in the space beside each statement.

1	2	3	4	5	6	7	8	9
Not at all								Very Much So

Physical Activity Goals:		**Commitment**
1.	How **personally committed** are you to your *short-term behavioural goals?*	
2.	How **personally committed** are you to your *short-term outcome goals?*	
3.	How **personally committed** are you to your *long-term behavioural goals?*	
4.	How **personally committed** are you to your *long-term outcome goals?*	

Nutrition Goals:		**Commitment**
5.	How **personally committed** are you to your *short-term behavioural goals?*	
6.	How **personally committed** are you to your *short-term outcome goals?*	
7.	How **personally committed** are you to your *long-term behavioural goals?*	
8.	How **personally committed** are you to your *long-term outcome goals?*	

GOAL INFLUENCE

Goal influence relates to the extent to which goals will/do affect behaviour. Please answer the following questions using the scale below. Beside each statement, place the value from 1 to 9 that represents the extent to which your goals influence you..

1	2	3	4	5	6	7	8	9
Influence 10% of the time or less				Influence about 50% of the time				Influence 90% of the time or more

Physical Activity Goals:

My short-term behavioural goals: **Influence Value**

1. Help me concentrate on what I am doing _____
2. Help me try harder _____
3. Help me persist in what I do no matter what _____

My short-term outcome goals: **Influence Value**

4. Help me concentrate on what I am doing _____
5. Help me try harder _____
6. Help me persist in what I do no matter what _____

My long-term behavioural goals: **Influence Value**

7. Help me concentrate on what I am doing _____
8. Help me try harder _____
9. Help me persist in what I do no matter what _____

My long-term outcome goals: **Influence Value**

10. Help me concentrate on what I am doing _____
11. Help me try harder _____
12. Help me persist in what I do no matter what _____

Nutrition Goals:

My short-term behavioural goals: **Influence Value**

13. Help me concentrate on what I am doing _____
14. Help me try harder _____
15. Help me persist in what I do no matter what _____

My short-term outcome goals: **Influence Value**

16. Help me concentrate on what I am doing _____
17. Help me try harder _____
18. Help me persist in what I do no matter what _____

My long-term behavioural goals: **Influence Value**

19. Help me concentrate on what I am doing _____
20. Help me try harder _____
21. Help me persist in what I do no matter what _____

My long-term outcome goals: **Influence Value**

22. Help me concentrate on what I am doing _____
23. Help me try harder _____
24. Help me persist in what I do no matter what _____

GOAL ACHIEVEABILITY

Goal achieveability is defined as the degree to which a goal can be reached. Please answer the following questions with respect to the goals recorded on your Goal Sheet. Only answer for each of the goals you stated. Therefore, if one goal is recorded for a section, provide one value. If five goals are recorded for a section, provide five values. Answer in order of the goals recorded on your Goal Sheet.

Using the following scale, from 1 to 9, rate how ACHIEVABLE you feel your goals are.

1 2 3 4 5 6 7 8 9

Completely certain goal is UNACHIEVABLE — Completely certain goal is ACHIEVABLE

Physical Activity Goals:

Short-term Behavioural Goals **Achieveability**

1. **Goal 1** from Goal Sheet _____
2. **Goal 2** from Goal Sheet _____
3. **Goal 3** from Goal Sheet _____
4. **Goal 4** from Goal Sheet _____
5. **Goal 5** from Goal Sheet _____

Short-term Outcome Goals **Achieveability**

6. **Goal 1** from Goal Sheet _____
7. **Goal 2** from Goal Sheet _____
8. **Goal 3** from Goal Sheet _____
9. **Goal 4** from Goal Sheet _____
10. **Goal 5** from Goal Sheet _____

Long-term Behavioural Goals **Achieveability**

11. **Goal 1** from Goal Sheet _____
12. **Goal 2** from Goal Sheet _____
13. **Goal 3** from Goal Sheet _____
14. **Goal 4** from Goal Sheet _____
15. **Goal 5** from Goal Sheet _____

Long-term Outcome Goals	Achieveability
16. **Goal 1** from Goal Sheet	_____
17. **Goal 2** from Goal Sheet	_____
18. **Goal 3** from Goal Sheet	_____
19. **Goal 4** from Goal Sheet	_____
20. **Goal 5** from Goal Sheet	_____

Nutrition Goals:

Short-term Behavioural Goals	Achieveability
21. **Goal 1** from Goal Sheet	_____
22. **Goal 2** from Goal Sheet	_____
23. **Goal 3** from Goal Sheet	_____
24. **Goal 4** from Goal Sheet	_____
25. **Goal 5** from Goal Sheet	_____

Short-term Outcome Goals	Achieveability
26. **Goal 1** from Goal Sheet	_____
27. **Goal 2** from Goal Sheet	_____
28. **Goal 3** from Goal Sheet	_____
29. **Goal 4** from Goal Sheet	_____
30. **Goal 5** from Goal Sheet	_____

Long-term Behavioural Goals	Achieveability
31. **Goal 1** from Goal Sheet	_____
32. **Goal 2** from Goal Sheet	_____
33. **Goal 3** from Goal Sheet	_____
34. **Goal 4** from Goal Sheet	_____
35. **Goal 5** from Goal Sheet	_____

Long-term Outcome Goals	Achieveability
36. **Goal 1** from Goal Sheet	_____
37. **Goal 2** from Goal Sheet	_____
38. **Goal 3** from Goal Sheet	_____
39. **Goal 4** from Goal Sheet	_____
40. **Goal 5** from Goal Sheet	_____

APPENDIX G

SAMPLE FROM SEVEN DAY PHYSICAL ACTIVITY AND NUTRITION LOG BOOK

PHYSICAL ACTIVITY LOG

Please list your short-term behavioural physical activity goal(s).

1. _____
2. _____
3. _____
4. _____
5. _____

In the following table, please list any activities that you participate in over the next 7 days that help you to meet your ***short-term behavioural physical activity goal(s).*** Along with the activity, please indicate the time spent and the intensity of the activity.

***NOTE**: **Low intensity** = not sweaty; **Moderate intensity** = a little sweaty; **High intensity** = very sweaty.

DAY	ACTIVITY	TIME SPENT (in minutes)	INTENSITY*- Low (easy), Moderate, or High (hard)
1			
2			
3			
4			
5			

DAILY NUTRITION LOG

Please list your short-term behavioural nutrition goal(s).

1. _____
2. _____
3. _____
4. _____
5. _____

In the following table, please list any nutritional behaviours that help you to meet your ***short-term behavioural nutrition goal(s)***. You should complete this exercise over the next *seven* consecutive days.
E.g. Chose fat free yogurt instead of regular.
E.g. Drank 8 glasses of water.

DAY 1:

Description of Behaviour

Day 2:

Description of Behaviour